The Home Garden Handbooks

ROCKWELL

DAHLIAS

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By

F. F. ROCKWELL

Author of

"AROUND THE YEAR IN THE GARDEN,"
"THE BOOK OF BULBS," ETC.

❧

Most American home-owners who raise flowers know and grow dahlias. Many, however, are content merely with growing for the blooms and have not realized the possibilities of combining dahlias with other plants in the home landscape, for hedges and screens, and in the garden.

In this book Mr. Rockwell suggests many new ways to use dahlias in the general planting scheme as well as for cutting. He calls attention to several lesser-known types and tells just how to grow the plants for best results.

The book considers proper soils and fertilizers, planting, care, protection, storing the roots, propagating, and growing dahlias for profit. Like its companion Home Garden Handbooks, DAHLIAS is written for the home-owner who grows flowers for pleasure and beauty. All such, whether or not they have grown dahlias, will find in this book much handy information and many new suggestions for the successful use and culture of this popular flower.

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F. F. Rockwell

- SHRUBS
- GLADIOLUS
- EVERGREENS FOR THE SMALL PLACE
- ROCK GARDENS
- IRISES
- DAHLIAS

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Drawings by

GEORGE L. HOLLROCK AND THE AUTHOR

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SET UP BY BROWN BROTHERS LINOTYPERS
PRINTED IN THE UNITED STATES OF AMERICA
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TO

MY FRIENDS OF THE NEW JERSEY DAHLIA SOCIETY

Who have contributed so greatly to
the development of the modern dahlia.

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HOW TO USE THIS BOOK

THIS is one of the Home Garden Handbooks. Like its companion volumes in the series, it is planned to give, in as few words as possible, the information you need in order to succeed with one important garden task. This book tells how to grow the finest dahlias for cut flowers and for garden effect, and how to get good roots for another season's planting.

No photographs are reproduced in this book. There are two reasons for this: first, the author feels that the points in the text which really need illustrating can be explained more clearly by drawings than by photographs; secondly, by omitting photographs, the publishers are able to give you at a much lower price the information which this book contains.

THIS BOOK IS DESIGNED TO SERVE PRIMARILY AS A SUPPLEMENT TO YOUR SEED AND DAHLIA CATALOGUES, in which you will find illustrated, often in color, not only the varieties mentioned in these pages but the host of new prize-winning dahlias which are introduced from season to season. Therefore, it should be studied and used in connection with your catalogues —the opening chapters, with their suggestions on how to use dahlias, before you order; and the succeeding chapters, on how to plant and care for your dahlias, before you do your planting.

The greatest care has been taken to make the index as complete as possible so that the reader may find immediately all the information which is given on any particular point, even though it may be referred to in several places in the book. Get the habit of consulting your Home Garden Handbooks while you are doing the work!

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DAHLIAS

INTRODUCTION

By Derrill W. Hart

Author of the annual "Dahlia Roll of Honor"

It is a bold challenge to garden lovers generally to state that the dahlia is the flower of the greatest popular interest in America to-day. But facts are facts, and the dahlia is the flower that has shown the greatest development in the last quarter of a century in America. Its popularity has increased until now there are more flower shows built around the dahlia than around any other flower.

As a lover of all flowers, I do not want to be accused of backing up the above statement by saying that this popularity has come to the dahlia because it is the most beautiful flower in the world. Beauty in flowers, as in other things, is relative. I cannot go quite that far; but I can say that, in my limited experience in the horticultural world, I have watched the dahlia grow from the point where only a few exhibitions in the fall were given to it, to where it is an important part of the flower shows now held in conjunction with state fairs, sectional fairs, county fairs, and numberless garden club shows. Even the Wall Street district of New York City has a dahlia show. But it is more impressive to relate that in a canvass of a single big building in that district, there were found over one hundred men who were dahlia hobbyists!

I think that the dahlia lover has some of the same qualities in his make-up as the golf fanatic. He is a perennial optimist. Not only does he look forward to the time when he will give the world the greatest seedling shown to date, but he displays the jealous interest of a parent over every new variety, with that aim in view. The dahlia seedling is the child of his imagination. It is to him an object of art, expressing beauty in bold, splashing colors in a manner that no other flower does. Each flower is a distinct personality; and I have yet to see the dahlia hobbyist who does not think in terms of the individual variety rather than in terms of the dahlia in general. With-holding fragrance, Nature has been lavish in the colors and the color combinations she has given to the dahlia. Perhaps it is this fact that explains why the dahlia has brought so many men into the floricultural world—to make of them not only lovers of the dahlia, but lovers of all flowers.

After all, the dahlia is an American development; and it was American dahlia growers, especially those of California, who gave the world the first spectacular dahlias. They were quite different from the formal, artificial types that had their run of popularity in the nineteenth century in England and continental Europe, and were far more impressive. After California came New Jersey, Connecticut, Massachusetts, and New York. And now it is safe to say that there is not a single state in the Union that lacks a dahlia society of some sort.

The national society devoted to the dahlia—The American Dahlia Society—constitutes one of the strongest flower societies in the world. This society has taken advantage of its opportunity to do constructive work, helping the dahlia to national popularity. It has set a high standard by which new varieties are judged before introduction to the public. The official trial grounds at Storrs, Connecticut, have been a meeting place of new varieties from year to year. There it is possible for the humblest amateur to get the national society rating on his seedlings, as compared with those of the most successful commercial growers. Thus the national society has prevented chaos and confusion in the introduction of new varieties. The society stages its annual show in New York City. Year after year the growth in this show has been reflected by the growth and popularity of the flower itself. No other flower can boast of such shows as those given over to the dahlia in Boston, New Haven, New York, Trenton, Camden, Philadelphia, San Francisco, and Los Angeles. These are only a few of the big shows, but one has only to visit any one of these shows to realize the tremendous hold the dahlia has over its admirers.

It is always a pleasure and a privilege to say a good word for the dahlia, and I hope those into whose hands this book falls will get as much pleasure and profit from reading it as I have had in reading the manuscript.

CHAPTER I

THE GREAT AMERICAN FLOWER

The history of most of our flowers, until very recent years, was written in Europe and then translated into terms of our own gardening.

But not so with the dahlia!

If there is any one flower which can be claimed as being typically American in development and in popularity, it is this. Not only is it American in origin—the wild species having come from Mexico—but American hybridizers have, for several decades, contributed infinitely more to its development than those of all other continents combined.

It would be dangerous to guess what flower in America is most popular, but certainly the dahlia comes very near the top of the list. Few flowers receive so much attention in the general seed catalogues; probably none is sold by so many specialists, large and small, in all parts of the country; and certainly none can boast so many local societies and well attended exhibitions. New dahlias command prices which must sometimes make the new roses blush with chagrin—or at least the rose dealers! And it is not the wealthy alone who pay good prices for dahlias, but "the butcher, the baker, the candlestick maker," as any dahlia specialist can tell you.

Why the Dahlia Is So Popular

Where lies the secret of the dahlia's popularity?

If we are to believe a statement frequently made, one of the reasons is that it is so easy to grow. The truth is, however, that dahlias are popular despite the fact that they are *not* to be classed among the most easily grown flowers. But this only makes their popularity the more impressive. The dahlia is popular because it offers, to a greater degree than any other flower, a wide range of bright colors and great size. These qualities, much more than form and fragrance, have a wide appeal, especially to the beginner, and to the hobbyist who wants to make a specialty of one flower, and to grow blooms bigger, better, and brighter than those of his neighbors. There is more friendly rivalry among dahlia growers than among the followers of any other flower. This breeds enthusiasm: the dahlia grower is always a booster for his favorite flower in general, and his own pet varieties in particular.

But the unsurpassed display value of the dahlia is by no means the only cause of its well merited popularity. It has many other excellent qualities to recommend it.

Despite the fact that the most popular types and varieties of dahlias may be, as some one has termed them, "the materialistic flower of a materialistic age," still this remarkable plant has broken, under the hand of the hybridizer, into an astounding number of forms and into a limitless range of colors; and any person who loves flowers is sure to find a dahlia that will appeal to him if he will but look for it.

Do You Really Know Dahlias?

Perhaps that is a dangerous question to ask. It is likely to anger both the single-track dahlia enthusiast, and the garden lover who may think he has no use for them.

There are two classes of people who go crazy over dahlias—those who adore them and those who abhor them. He who discusses dahlias from any other than the orthodox point of view is likely to be condemned by both camps. Not so long ago I had an interesting illustration of this. After a garden talk, two intensely earnest ladies sought me out to present their points of view. The first said, "Surely you were not serious when you suggested that we plant dahlias in our gardens—right in with the other flowers! I think that all dahlias are *terrible*. There is nothing graceful or artistic or refined about them. Some of my friends grow them as flowers for cutting, in their vegetable gardens; but I would no more think of planting them in my flower garden than I would of planting cabbages."

Her back was hardly turned when her garden club sister approached. And this was her comment:

"I enjoyed your talk so much! But I must say I hardly think you were fair to the dahlias. I don't know what my husband would have done if he had been here. They are the only flower he takes any interest in, and we have our yard full of them. Some blooms almost a foot in diameter, and the most gorgeous colors! I like to hear about the other flowers too, although we don't have room for any. But never ask me to give up our beautiful dahlias!"

Well, of course, I had not asked this good lady to give up her beloved dahlias, any more than I had suggested to her neighbor to fill her garden borders with dahlias, bearing flowers twelve inches across, which would have to be tied up to six-foot stakes. I had merely tried to call to their attention that many types and forms of dahlias exist about which, unfortunately, most amateur gardeners know little, and many nothing. These other dahlias are well adapted to purposes for which the majority of the popular large-flowered cutting dahlias are not suited.

It is, therefore, not merely the dahlia "fan," but also the gardener who is indifferent to dahlias, or even prejudiced against them, whom I have in mind in writing this little book. Those who chance to belong to the latter class, I urge not to allow their prejudice to stand in the way of the enjoyment of this beautiful and truly remarkable flower. Though they may have little use for the "garden" of the average dahlia enthusiast, with its typical rows of stakes and high, stiff plants supporting a few enormous blossoms, there are other types of dahlias, and other ways of using them, which they are sure to welcome once they have given them a fair trial.

For the dahlia really has many merits besides its outstanding qualities as a cut flower for autumn, and the fact that it reigns supreme as a popular show or exhibition flower. It has its place in the garden, and even in landscape planting. What other flower will give so many blooms to the plant, over so long a period? It propagates so readily and surely that it is one of the least expensive of all flowers to use. In one form or another, the dahlia well merits a place in every American garden.

CHAPTER II

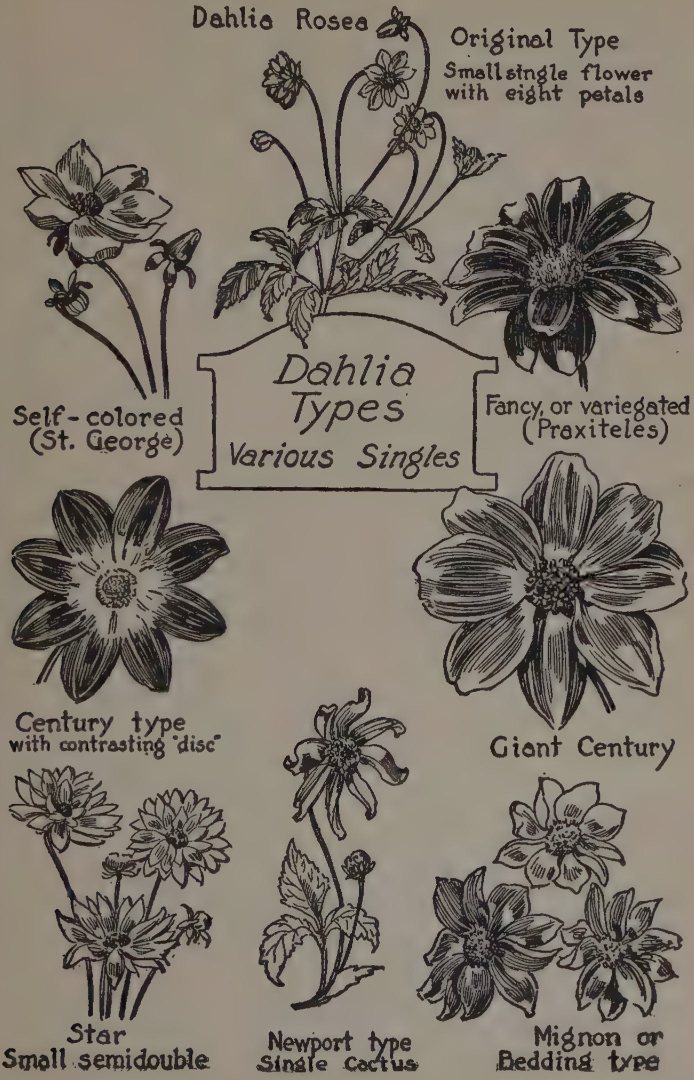
TYPES AND VARIETIES AND THEIR USES

The time approaches, even though it has not yet arrived, when the immense double-flowered dahlias, now so popular that they occupy perhaps nine-tenths of all the space given to the dahlia in catalogues and at exhibitions, will no longer have the stage so exclusively to themselves.

I do not mean to imply that the decorative and some of the newer hybrid-cactus varieties—which are so similar to them that even the experts have difficulty in deciding to which type they belong—are not beautiful flowers, meriting the admiration they command. But it is to be regretted that so many excellent dahlias of other types have been comparatively neglected in catalogues, at the shows, and in dahlia literature. And I would urge the dahlia grower, whether he be a new recruit or already an enthusiastic hobbyist, to make himself more familiar with these other types, and thus extend the pleasure he may derive from dahlia growing.

Origin of the Modern Dahlia

As garden flowers go, the dahlia is a recent addition to the society of the elect. Its beginnings are not, like those of the rose and the iris, lost in the unrecorded past. This extraordinarily variable flower, which we now have in so many forms and colors that it is almost impossible to classify or even to describe them, has its origin in a few species native to the higher altitudes of the Mexican mountains and plateaux. Though coming from so far south, the dahlia belongs not to the tropical but to the temperate zone. Even after generations of garden culture, and when grown in northern states, they suffer severely from long spells of hot dry weather.


Dahlia Rosea
Original Type
Small single flower with eight petals
Self-colored (St. George)
Dahlia Types
Various Singles
Fancy, or variegated (Praxiteles)
Century type with contrasting "disc"
Giant Century
Star
Small semidouble
Newport type
Single Cactus
Mignon or
Bedding type

The native Mexican species are to be found, for the most part, on volcanic soils, consisting largely of disintegrated lava, and never lacking moisture during the rainy season when the plants make their growth. Late autumn frost does not kill them down, as in our northern states; but the arrival of the dry season, in October or November, terminates their growth, and the moisture contained in the stems and the foliage is reabsorbed into the tuberous roots. (These roots, it may be remarked here, are not true "tubers." But they are usually so termed in dahlia parlance.)

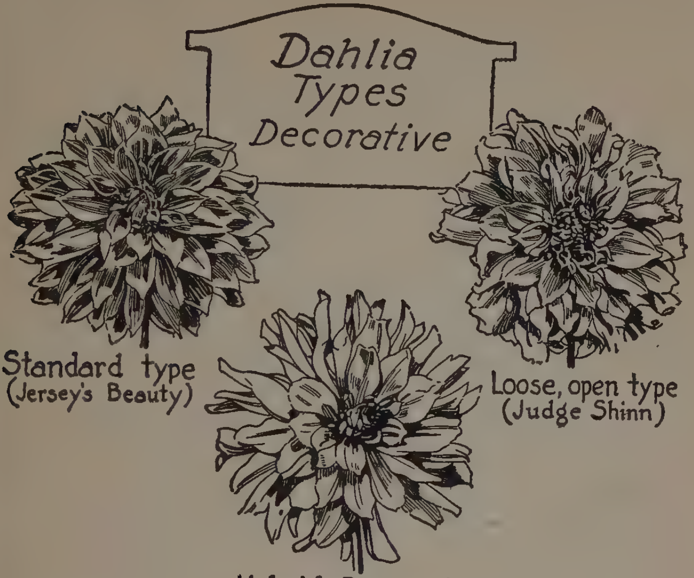
The Mexicans had already utilized the dahlia as a garden flower and, undoubtedly, had developed hybrid varieties of their own, before the coming of the Spaniards in 1519. However, not until nearly three hundred years later—in 1791—is there any record of the first dahlias being grown in Europe—at the Botanic Gardens in Madrid, Spain. The modern forms have all been developed since 1800. The dahlia was named after the famous Swedish botanist Dr. Andreas Dahl. The native Mexican name was Acocotli, meaning "water pipe."

Under the different soil and climatic conditions of Europe the dahlias grown there immediately began to "break" into new forms and colors, and to show a marked tendency toward doubling—though some of the Mexican forms also, in this respect, were not unlike the modern peony-flowered type.

The efforts of the European hybridizers, on the Continent and in England, were centered particularly on producing densely doubled dahlias of absolutely symmetrical form. Those of uniform coloring came to be known as ball or show dahlias; others, of variegated coloring, as fancy dahlias.

These flowers naturally created great excitement in the flower garden world, and soon became immensely popular. But with the development of the Ball type to the neglect of all others, public interest naturally waned, despite all the attempts of the florists and the exhibitors of that day to maintain an artificial interest in what had become a distinctly artificial flower.

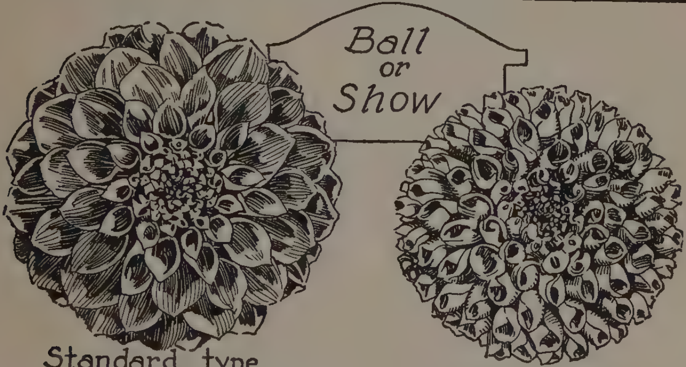
This condition continued until about 1875. (Authorities



Standard type
(Jersey's Beauty)

Loose, open type
(Judge Shinn)

Hybrid Decorative
(Dolly Warden)



Standard type
(Waldheim Glory)
one of the largest of all Dahlias

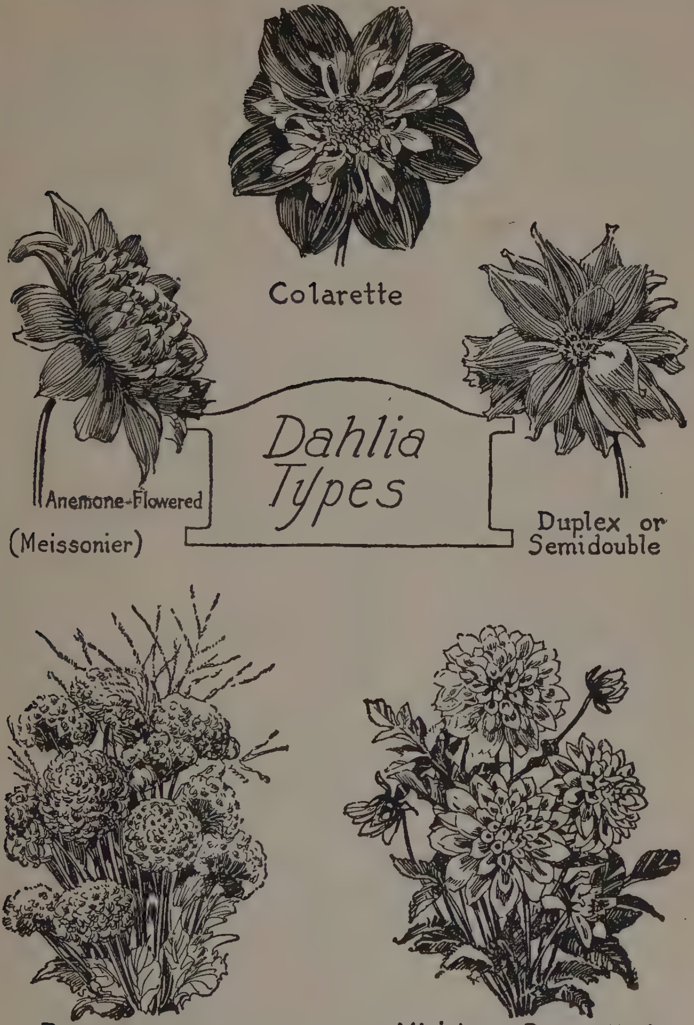
Quilled type
(Dreer's White)

differ, as they usually do, as to the exact date; and also, as usual, it makes little difference.) At this time there appeared in the garden of a Holland gentleman an entirely new form, the petals being reflexed and pointed. This, in combination with its blood-red color, gave the flower a distinct resemblance to the scarlet bloom of a well-known species of cactus—and was called the cactus type. This new dahlia, which was named *juarezi,* after the Mexican president of that day, was, like so many of our horticultural advances, not the result of years of painstaking work, but one of those strange freaks of nature which almost make us feel that even so small a thing as the creation of a more artistic flower form is not forgotten

> "In Midnight by the Master of the Show
> Whose secret Presence through Creation's veins
> Running, quicksilver-like, eludes our pains."

For if well authenticated records are to be believed, this new form of dahlia came from the only surviving dahlia tuber in a miscellaneous collection of roots and plants, shipped from Mexico; and so far as it has ever been possible to learn, it was unlike any dahlia known in Mexico! This new form, despite the scorn of florist and showman, immediately caught the public fancy to such an extent that the dahlia soon became more popular than ever. Hundreds of new varieties were introduced and catalogued. These were mostly hybrids descended from Dahlia *juarezi,* and Dahlia *rosea* (formerly *variabilis*). Our modern dahlias owe more to these two than to all others combined.

When dahlia production began to be taken up commercially in this country, the stage was all set for just what happened. Here the plant found more congenial climatic conditions; psychologically it was ideally suited to a country of new gardens and new gardeners; and it was ready to reward even the amateur hybridizer with innumerable new varieties on his first attempts at growing seedlings. America adopted the dahlia as its own, and within a few years had established world leader-



Dahlia Types

Colarette

Anemone-Flowered (Meissonier)

Duplex or Semidouble

Pompon or Miniature show

Miniature Decorative) (Little Jewel)

ship in the production of new varieties and the commercial production of roots. The success of American dahlia growers has, undoubtedly, given confidence to the devotees of other popular flowers in establishing their independence of the European hybridizers and striking out for themselves.

Classification of Dahlia Types

The present classification of types of dahlias as established by the American Dahlia Society follows. This classification has already been somewhat outgrown, but the problem of making a newer and better one has not yet been solved.

CLASSIFICATION OF DAHLIAS

(As adopted by American Dahlia Society)

CLASS 1—CACTUS

A—Cactus: True fluted type; petals long, incurved or twisted: (Ambassador)

B—Hybrid Cactus: Petals shorter than in A, and broader; recurved, or twisted: (Attraction)

CLASS 2—DECORATIVE

Decorative: Double flowers, full to the center; flat rather than ball-shaped; with broad, flat, loosely arranged florets: (Jersey's Beauty)

CLASS 3—SHOW

A—Show: Flowers globular, rather than broad, showing regular spiral arrangements of florets: (A. D. Livoni)

B—Hybrid Show: Flowers broadly hemispheric, to flatly globular; more loosely built than in the true show, with the spiral arrangement not so well defined: (Dorothy Peacock)

CLASS 4—PEONY

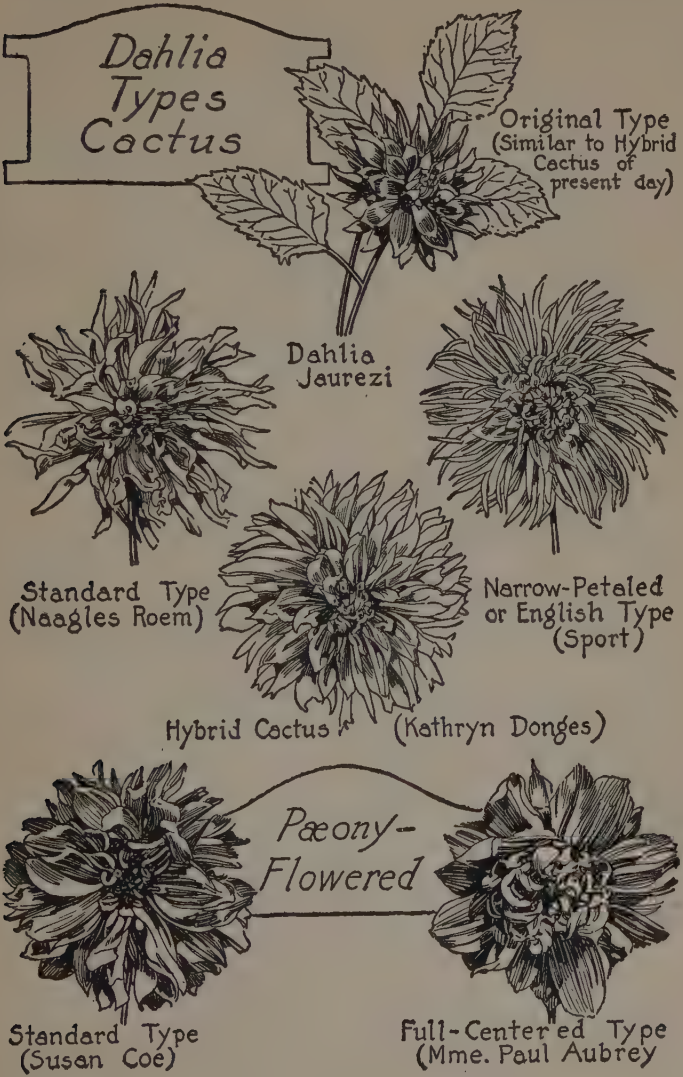
Semi-double flowers, always with an open center; the inner floral rays should be twisted and curled: (The U. S. A.)

CLASS 5—DUPLEX

Semi-double flowers with center always open; always more than one row of petals or florets (many so-called Peony varieties really belong in this class:·(Mme. Coissard)

CLASS 6—SINGLE

Open-centered flowers, small to very large, with eight to twelve floral rays, more or less in one circle; should always have only one row: (Rose-pink Century)


Dahlia Types Cactus
Original Type (Similar to Hybrid Cactus of present day)
Dahlia Jaurezi
Standard Type (Naagles Roem)
Narrow-Petaled or English Type (Sport)
Hybrid Cactus (Kathryn Donges)
Pæony-Flowered
Standard Type (Susan Coe)
Full-Centered Type (Mme. Paul Aubrey

CLASS 7—COLLARETTE

Single type, with one or more smaller rays usually of a different color, from the heart of each ray floret, making a collar around the disk: (Maurice Rivoire)

CLASS 8—ANEMONE-FLOWERED

Flowers with one row of large floral rays, like the singles, but with each disk floret producing small, tubular petals: (Meissonier)

CLASS 9—POMPON OR MINIATURE

Small-flowered; should not be over two inches in diameter; usually globular in shape: (Nerissa, true Pompon; Little Jewel, Miniature Decorative)

Comparative Merits of the Several Types

There is an old Roman saying, "De gustibus non est disputandum"—there is no disputing about taste. The originator of this remark must have had a prophetic vision of a dahlia society meeting, or rather of the informal heart-to-heart—sometimes almost fist-to-fist—discussions which invariably follow, often into the wee sma' hours, after the business session is over.

I know that to raise a voice in favor of almost any of the dahlia types except the decoratives, and the hybrid-cactus which merge into them, is to be considered a crank with poor taste, and no appreciation of the dahlia, especially by the male members of the organization—and there are always plenty of men in dahlia societies, even though they leave most of the other flowers largely to the ladies!

Despite this attitude of so many amateur and semi-amateur growers, and not a few of the professionals—if we are to judge by the type of dahlia they spend their energies in developing—the other dahlias are slowly winning greater recognition. One visiting the larger dahlia shows, and keeping his eyes and ears open, can hardly fail to realize that there is at least a mild rebellion by the general garden public against the overemphasis on size, and the more coarse and stiff forms of the decorative type. The ball dahlia had its day and passed; the decorative dahlia, notwithstanding its present vogue, is likely to escape a similar fate only if other qualities besides size and symmetrical formation are given more consideration than they have had in the past.

Possible Future Development

It may be idle to speculate as to what the dahlia, which has done such surprising things in the past, is likely to do in the future. Two things, however, seem certain: the development of real garden and landscape types of dahlias—the former, low, if not dwarf-growing, with some refinements in general habit of growth and the free production of moderate-sized blooms over a long season; the latter developed especially for resistance to insects and diseases, and to hot-weather conditions.

The second general line of improvement is the achievement of greater variety in form, in small dahlias for cutting and for bouquets. Belle of Springfield and Little Jewel are examples of what may be done in this direction. Both of these fine dahlias are not true pompons, although they are generally listed in this class. There is more need for new two-inch dahlias than for ten-inch ones! And the *fragrant* dahlia is by no means impossible.

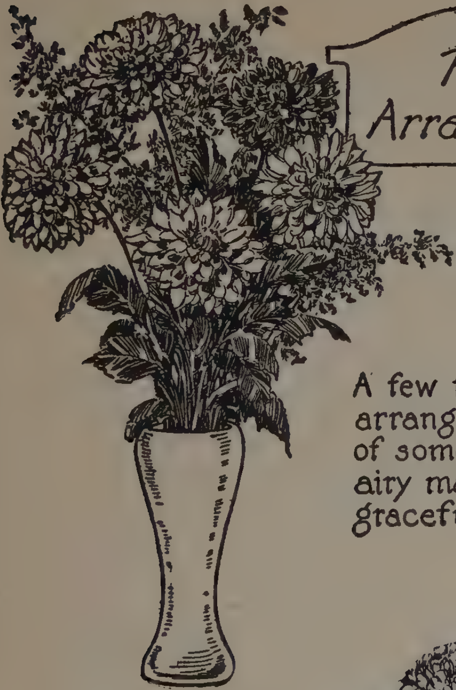
Uses for the Dahlia

Notwithstanding the insistence by dahlia enthusiasts and growers that the dahlia is "the most wonderful and useful of all flowers," they have really done little to demonstrate its usefulness. Who, for instance, has ever seen an exhibit at a dahlia show illustrating dahlias employed in landscape planting? Such an exhibit there may have been; I have never chanced to see one. Indeed, it is only recently that good examples have been shown of dahlias for cut-flower decoration! Certainly, a large proportion of all dahlias planted are for cutting; yet many dahlia growers, both professional and amateur, know little of how to use them effectively and artistically for this purpose. One still sees dahlias, both at exhibitions and in private homes, jammed tightly together in vases designed for much smaller flowers, without a single spray of any supplementary greenery, such as gypsophila, asparagus foliage, or even the common grasses of the field, to relieve the somewhat overweighty appearance of even the most beautiful of the heavy-flowered varieties. Try the very simple experiment of arranging a vase of dahlias for the best effect you can get—and then removing half of them, and rearranging those remaining, with the addition of some lighter and more airy foliage!

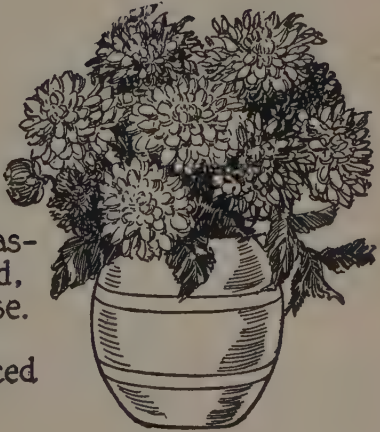
In the Garden. But the dahlia is by no means restricted to cut-flower purposes. Though too seldom so employed, it is valuable in the real flower garden with other flowers, giving a great abundance of color between the passing of many of the summer flowers and the coming of those autumn flowers which are at their best after the early frosts. Moreover, there have been developed in dahlias "autumn" colors unequaled by those of any other flower. Among the decorative, hybrid-cactus, and cactus sorts of moderate growth (if grown by the low-branching, self-supporting method suggested on page 36) are many varieties which may be satisfactorily used. The true cactus sorts, for the most part, have those goose-necked or semi-goose-necked stems which are a disadvantage here as well as for cutting; this, however, is being overcome in the best of the new varieties. The easiest and most satisfactory dahlias for garden and border planting are the singles and the mignon or Tom Thumb, and other "dwarf bedding" types. Some of the pompons will do, but they are rather more bushy and spreading in growth. Keep this in mind when placing them.

Landscape Planting. Dahlias in the landscape have been neglected even more than for the garden. Few shrubs flower after late midsummer, and there is hardly a place of any size which is without a corner or two, at the margins of the lawn, where dahlias cannot be effectively placed against shrubs or evergreens. Varieties which require some support may be used here, as the stakes, at a distance, are inconspicuous. The taller-growing varieties, against a suitable background, are especially telling. Take, for instance, Couronne d'Or, with its golden blossoms swung aloft like yellow lanterns in the autumn twilight. And that finest of all general-purpose dahlias—Jersey's Beauty, which, even without coddling, attains a height of five or six feet and possesses distinct mahonia-like foliage which would be almost worthwhile for landscape purposes if

Flower Arrangement



A few flowers, loosely arranged, with sprays of some lighter, more airy material to add gracefulness



How not to use dahlias—typical over crowded, stiff and stilted vase. No wonder many persons get prejudiced against dahlias!

the plant did not produce a bloom. For white against dark green, Gladys Sherwood is almost startlingly beautiful.

For Temporary Hedges. How often there is use, especially about the new place, for a temporary hedge which we should like to have also a thing of beauty. Have you ever thought of the dahlia for this purpose? If you try it, you will be both surprised and pleased with the result; I know of nothing attractive for this use, so quickly and easily grown. Of course, but one variety should be planted, and this, unless of naturally dwarf habit, should be induced to form a low bushy growth by pinching off the tops of the shoots when the second or third set of leaves has formed. The free-flowering pompons, such as Snowclad, are excellent for hedges; and most of them can be purchased so cheaply that they make an inexpensive planting. The dwarf sorts, such as the mignon type, may be planted where a dwarf hedge is wanted; or one of the singles, such as St. George, with its freely borne lemon-yellow blossoms, Snowclad, pure white, or the crimson-flowered Jack, if a taller hedge is needed. Many of the popular cut-flower varieties are sufficiently free-flowering for this purpose, but ordinarily the singles or pompons will be more satisfactory, as well as less expensive if roots are purchased.

Bedding. The use of dwarf dahlias for solid beds of color is comparatively new in this country, although they have been so employed abroad for some time, with the consequent development of varieties particularly adapted to this use. Some of these are now listed in our catalogues; others will undoubtedly be developed by our own growers.

These suggestions, necessarily limited, give but a hint of the uses to which the dahlia is not commonly put. The important point is that the gardener should come to think of dahlias *as planting material,* quite aside from his collection of exhibition varieties, trained neatly to their stakes in a patch behind the vegetable garden or the garage. If the dahlia is, indeed, the queen of the late summer flowers, we should not be treating her as a Cinderella, excepting when the Fairy Godmother—or Godfather—exhibitor whisks her off to the Prince's Ball in the exhibition hall!

CHAPTER III

SOILS AND FERTILIZERS

Much that is written on the selection of soils for dahlia growing is of little practical use to the amateur. Ordinarily, he may not "select" the soil in which his plants are to be grown at all, but must take what he has and make the most of it. Usually, he cannot even practice rotation, but is compelled to grow them, season after season, on the same spot.

Do not worry about your soil; you can grow satisfactory dahlias in any type of soil, provided only there is fairly good under-drainage. In some soils, you will have to work a bit harder than with others, especially for the first two or three seasons; but that is no serious handicap if you do not expect to grow commercially. I have seen thousands of dahlias grown in heavy soil, and yet some of the finest flowers and the cleanest, smoothest tubers I have ever produced—I barely rescued a batch of them from going into the oven as sweet potatoes!—were grown in the lightest kind of light sandy loam.

The dahlia is found growing natively in a light soil of volcanic origin, where the drainage is perfect. Humus has been supplied in abundance through the annual decay of the rank growth of the dahlias themselves. The soil is naturally rich in potash. Moisture is supplied through the growing season by the almost daily rains, and heavy dews. The air is dry, because of the elevation of some thousands of feet above sea level; but it is not hot, and the air drainage is perfect, the cold air flowing down at night from the higher mountain regions, and Nature's dahlia garden being fully exposed to the constant winds.

We cannot recreate in our own small gardens all these conditions. And we are growing not the native species of Mexico, but dahlias which have been produced under generations of garden culture. Nevertheless, the more nearly we can approximate these conditions the better will our dahlias fare. This is one reason why dahlias always do especially well near the seacoast, where summer climatic conditions are more nearly like those of their native mountains than on the inland plains, which have prolonged periods of searing dry weather.

The Ideal Soil for Dahlias

In the comparatively small area that the average home gardener can devote to dahlia culture it is possible to build up in a few years an approximately ideal soil, if he knows what to aim at when he starts.

The statement is frequently made, "Any good soil will grow good dahlia." In a sense this is true. Nevertheless, some soils which are excellent for many garden purposes will not produce the best dahlias, unless they are altered to meet the specific needs of this flower; other soils will produce good dahlia flowers but will not grow satisfactory roots. Heavy, "tight" soils often produce plants that will blossom well enough, but prevent the normal development of the tubers; soils too rich in animal manures, or other highly nitrogenous fertilizers, may give big roots which will not keep.

What, then, is the ideal dahlia soil?

In a few words, it is a well-drained, medium or light, sandy loam, especially well supplied with humus, or decayed vegetable matter. Such a soil is warm and loose; it does not bake hard, preventing the free expansion of the large tuberous roots; or become overhot in midsummer, thus checking the top growth.

Drainage. Drainage, unless it is naturally good, is the most difficult thing to improve. If the conditions are radically wrong, it may be necessary to put in drain tile. For a soil inclined to stay wet after heavy rains, but not situated in too low a spot, putting in a layer of gravel or cinders six or eight inches thick, eighteen or twenty inches below the surface, will often give all the drainage necessary. If this is done with a section of the garden at a time, beginning with the poorest spot first, it will not prove so serious a task as it may at first appear.

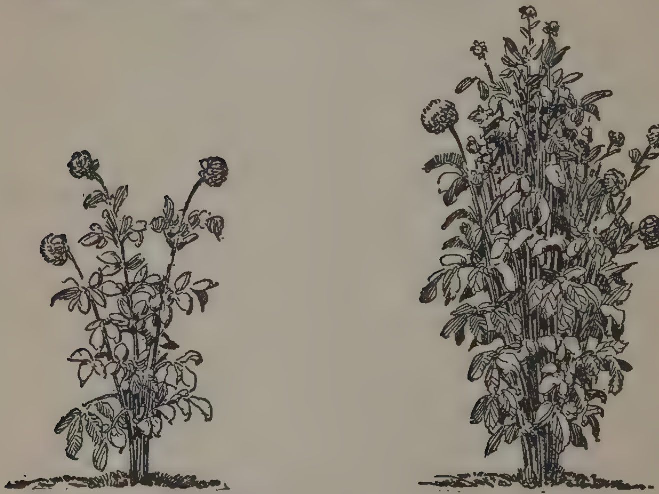
Improving Heavy Soil. Soils which contain a considerable percentage of clay, while excellent for many plants, are not suited for dahlia growing. They are hard to work, remain wet and "cold" in the spring, bake hard and get hot during midsummer, restrict the development of the tubers, and do not encourage them to "ripen up" as they should in the autumn; and harvesting is difficult. It is true that they are retentive of plant food and of moisture, but these advantages do not make up for the disadvantages.

The addition of sand, sandy gravel with the larger pebbles removed, or of coal or wood ashes, in generous amounts, will help to break up and lighten a stiff soil by separating the clay particles. Mrs. Stout, in her excellent work, "The Amateur's Book of the Dahlia," relates an unfavorable experience with coal ashes, and advises against their use. Possibly, in her experiment, the ashes were sifted too fine, or were used directly from the furnace without previous exposure to the weather. At any rate, I have never seen any indication of injury from coal ashes, which I have used often in soil for dahlias as well as for other crops. I sift out only the coarser cinders, and apply the ashes preferably in the autumn, working them into the upper six inches of soil. Lime, which also helps to make more friable a heavy soil, may also be used in moderate amounts; but it is safer to avoid it, as dahlias do not require a "sweet" soil, and are sometimes subject to a form of scab, similar to that attacking potatoes, which is more likely to occur in soils containing an abundance of lime. The amount of lime contained in wood ashes or cinders will not do any harm.

With the first application of any of the materials mentioned above, a decided improvement in the mechanical condition of a heavy soil will be noticeable. This treatment may be repeated every autumn or early spring until the ground becomes as loose and friable as is desired.

Treatment of Light, Sandy Soil. Very light or sandy soils, while ideal in many ways for dahlia growing, are wasteful of plant food, and do not retain the moisture—which, as we have seen, is one of the essentials for their consequent growth. These shortcomings in a light soil may be overcome by the addition of humus or decayed vegetable matter. As dahlias are usually not planted until well along in May, it is possible to grow a "green manure" crop, such as rye or winter vetch, on the dahlia patch. These may be sown immediately after taking up the dahlias, or, between the rows, two or three weeks before. There will then be a thick mat of green manure to dig or plow under, two to four weeks before planting time, in the spring. This is the most economical way to add humus to a light soil.

Other materials which may be used are thoroughly decayed manure, when it can be obtained, leaf mold, a compost of rotted leaves and other decayed vegetable matter, commercial humus, or granulated peatmoss. The latter material is particularly effective in promoting a vigorous but normal growth of dahlias. Even in soil well supplied with humus, I mix several quarts of peatmoss in each "hill" at planting time.



Dahlias grown without and with peat moss in the soil. (From photographs.)

All of these humus-forming materials, which are absolutely essential in improving a light sandy soil, are also of great benefit to heavier soils. No matter what class of soil you may have, the more *humus* you can get into it, the better dahlias you will grow.

Fertilizers for Dahlias

The beginner is often confused by conflicting directions as to how he should fertilize his dahlias. He may read in one place that they are gross feeders, and that the soil can hardly be made too rich for them; and in another that they will do better on a restricted fare.

The facts in the case are that the dahlia is a rather greedy plant, and is ready to make something of a pig of itself, to its own detriment, if it has the opportunity.

Like all plants, the dahlia must be supplied with nitrogen, phosphoric acid, and potash. It should, however, be given less nitrogen, in proportion to the other ingredients, than most flowers. It *does* require an abundant supply of phosphoric acid and of potash. If one is buying a ready-mixed or complete fertilizer, an analysis of two to three per cent of nitrogen, eight to ten of phosphoric acid, and six to eight of potash, should be sought for.

Most ready-mixed complete fertilizers are made up largely from chemical sources. As the rapidly growing roots of young dahlia plants, either from tubers or from green plants, are easily injured by coming into contact with chemical fertilizers, I always use for dahlias medium coarse *raw* bone meal, supplemented by a small amount—ten to twenty per cent—of tankage; the latter is not essential, but helps to give the plants a stronger start at the beginning of the season. The bone meal and tankage mixture supplies nitrogen and phosphoric acid. For potash I use wood ashes or tobacco fertilizer, or both. Briefly, one may say that for dahlias there is no danger of getting too much phosphoric acid; there is no advantage in using too much potash; and there is positive likelihood of serious injury in using too much nitrogen. A surplus of the latter causes rank, soft foliage, few flowers, and sappy tubers, prone to decay.

Applying the Fertilizers. For soil in fair condition, allow four or five pounds of the bone meal—or of bone meal and tankage—to each 100 square feet; about the same amount of the tobacco fertilizer; and twice this amount of wood ashes. It is much better to spread half or two-thirds of this broadcast over the soil before planting, raking it in, than to place all the fertilizer in the "hills," as is frequently done. Part of the fertilizer very thoroughly mixed under the tubers or plants will help them to get a vigorous start. Our aim should be, however, to induce the roots to spread through the soil as widely as possible, and this is not accomplished by concentrating all the fertilizer in the hill.

Top-dressing. The dahlia shows quickly when it is not receiving all the nourishment it should. The careful grower, watching his plants, will soon learn when a supplementary top dressing should be given after planting, to maintain vigorous growth. This is taken up in detail in the following chapter.

Preparing the Soil for Planting

Dahlias root deeply, and respond to thorough cultivation. The soil where they are to grow should be dug deep, at least eight inches and better twelve to fifteen. Unless the top soil is deep from long previous cultivation, it is a good plan to "double-work" the ground—that is, to *remove* the top soil from an area of convenient size; fork up the soil below this where it lies; and then throw over on top of this, the top soil from the next strip. This will leave another area of the lower soil exposed, to be forked up where it is. In this way, the entire garden may be thoroughly pulverized to a considerable depth, without bringing any of the raw soil to the surface.

After this preliminary digging, the surface should be forked over, and thoroughly fined with the rake. It is a decided advantage to thoroughly prepare the soil two or three weeks before planting.

CHAPTER IV

PLANTING AND GROWING

Of all garden flowers, perhaps no other is at once so easily grown, and so likely to play exasperating tricks upon the grower, as the dahlia. The statement, frequently made in dahlia sales literature, that this flower is one of the easiest of all to grow, is hardly correct. It would be much more accurate to say that dahlias may be easily grown—under certain conditions.

The dahlia, despite its robust and husky growth under favorable circumstances, is a very sensitive plant. It responds more quickly and more certainly than almost any other flower to such cultural treatment as it finds acceptable; but, by the same token, it also suffers more quickly than most from neglect or, what is equally fatal, coddling and care of the wrong sort. This is the reason why the inexperienced beginner frequently has greater success in growing dahlias than the amateur enthusiast who has progressed a stage further, and begun to try out a lot of special and half-digested theories. The gardener who will follow consistently the suggestions given in this chapter and the next may look forward with reasonable certainty to success, even in an "off year" for dahlias.

Types of Plants Available

First of all, the beginner must learn that a dahlia does not form a real bulb like a narcissus or an onion, or even a corm, like the gladiolus, but *tuberous roots.* These enlarged fleshy roots, the purpose of which is to store up food during the season when the plant is dormant, to be utilized in starting new growth at the beginning of the next growing season, are commonly called "tubers."

When a bulb or a corm is planted, it sends out roots directly from its own base, and top growth from its apex or upper surface. In the case of a dahlia tuber, however, the new growth, both top and root systems, is developed from a growing point or "eye," the tuber serving merely the purpose of supplying food until the new plant can gather it directly from the soil, through a root system of its own. Without this eye, the tuber is absolutely worthless. One good strong eye, with enough of the tuber accompanying it to give the new growth a fair start, is all that is necessary for the development of a perfect plant. The most enormous tuber has no possible advantage over one just sufficiently large to give the necessary push to get the top well started.

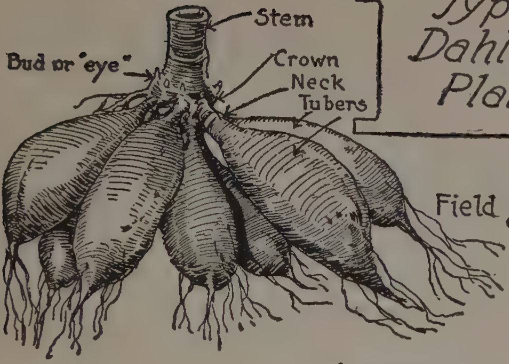
Dahlia tubers differ from those of the potato in that they are produced in a clump, all attached to the old stem or stalk. Furthermore, the eyes from which the new plants start are located at the base of the old stalk, and not upon the surface of the tubers or roots. The several tubers forming the "clump," attached to the base of this old stem, have more or less slender "necks" which are easily broken. A broken-off tuber is absolutely valueless, because it carries with it no growing point or eye.

Dahlia tubers differ from potatoes also in that they easily dry out and shrivel, or decay, and are more easily injured by low temperatures while in storage. This fact is mentioned because it is often stated that they can be kept over like potatoes, or with potatoes—one of the many half-truths in connection with dahlia growing which so often cause trouble.

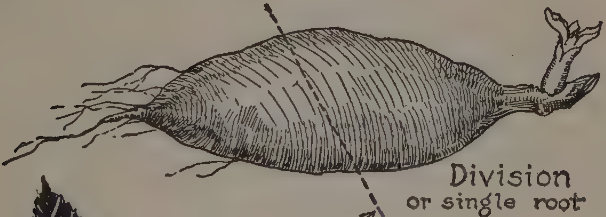
Dahlias are sold for planting by the amateur in several different forms: field clumps; single roots, or "divisions"; pot roots; and "green" or growing plants. Any of these, if good of its kind, will prove satisfactory, but each possesses some relative advantages and disadvantages.

Field Clumps. This term refers to the clumps of roots or tubers as they are dug from the field. If one wishes a number

Types of Dahlias for Planting



Field grown clump



Division
or single root

Cut off part of
tuber if very large

"Green" or
growing plant.

Pot-grown root.

of plants of the same variety, to secure a "stock" for a mass planting, this is often a very good way to buy dahlias. But it is never a good way to *plant* them. A clump of roots will throw up so many shoots that the result is merely a tangled mass of growth with few and inferior blooms. Even when one wishes a mass of dahlias of one variety, it is better to set out single plants, in a group close together, than to plant an undivided clump. (For information on how to divide the clumps, and prepare them for planting, see page 58.) After separating the clumps, place the divisions in two or three inches of peatmoss or leaf-mold in a fairly warm place. This has the double advantage of "plumping up" the tubers in case there has been any drying out or shriveling, and also of starting the buds just sufficiently for them to be readily distinguished.

Single Roots. Single roots are "divisions," and when received should be treated in the manner suggested above unless they are already in perfect condition. All things considered, the single root is, probably, the most satisfactory form in which new varieties may be obtained by the beginner.

Pot Roots. A "pot root" is merely a miniature clump of roots, produced as the result of growing the dahlia plant in a pot—usually three- or four-inch—instead of in the open ground. Abroad, this method is used quite generally for commercial propagation. Here it is employed chiefly in the growing of seedlings, in order to save space until the plants come into bloom and the undesirables can be eliminated. There is no reason, however, why the amateur should not take advantage of this method of propagation for his own use. (For a full description see Chapter VIII, page 69.) Pot roots, or divisions from them, although they are very much smaller than the field-grown tubers, produce perfectly satisfactory flowering plants. It is difficult to understand why they are not in greater commercial use; possibly it is because the American buyer likes to get quantity whether there is any particular advantage in it or not.

Growing Plants. Growing, or "green," plants are yearly coming into more general use and favor. The prejudice against them is gradually disappearing, as results prove they will produce satisfactory flowers and roots, if properly handled. Their chief advantage is that they make it possible to procure the high-priced newer varieties at about half the cost of single tuber divisions. Many professional exhibition dahlia growers prefer green plants to tubers, regardless of any saving which may accompany their use. The argument that green plants will not produce tuber clusters is without foundation. There are, however, good and inferior plants, just as there are good and inferior tubers. Properly handled, a good plant will prove perfectly satisfactory. The production of green plants is described in Chapter VIII. It is true that a small growing dahlia plant must be handled somewhat more carefully than a dormant tuber, but this is no real argument against using it.

PLANTING

Almost every point in dahlia culture forms a storm center for divided opinions by the experts. The greatest trouble with the advocates of one system or another is that they usually fail to recognize that possibly both are right, under varying conditions!

When to Plant. It is an easy matter to give specific dates for planting, but this does not help the amateur to know just why he should plant early or late. To form any intelligent opinion of his own as to when he should plant, it is necessary for him to consider two very important factors.

The first of these is that the dahlia, to do its best, must be *maintained in an active state of growth,* without check or interference, from the time it starts until its last flowers have been produced. If there is a check from any cause, the cell tissues harden, the stalks and branches become tough and "woody," and no amount of feeding and watering can bring the plant back to a state of active growth, which is absolutely essential for the production of good bloom.

And the second point to consider is when and for what purpose the flowers are wanted. We have already seen (page 6) that while the dahlia comes from Mexico it is not really a tropical plant; the flowers will not be produced at their best during extremely hot, dry weather, no matter how much we may do, artificially, to overcome these conditions.

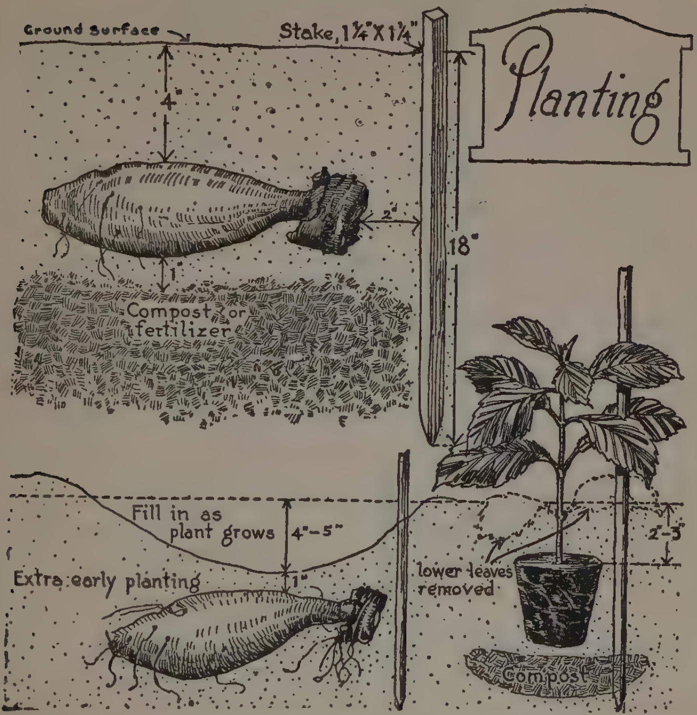
The dahlia grower, therefore, should aim to time the planting of his dahlias so that they will not receive any check during their growth, and will produce bloom when it is wanted, and under favorable conditions.

One way to determine when to plant, therefore, is to figure *back* from the time the flowers are desired, or are likely to encounter conditions favorable to perfect development. From planting time to flower-development will usually require ninety to a hundred days for tubers, and sixty to ninety days for growing plants. The length of time varies with different varieties, growing conditions, and the system of growing or training used.

If then, we wish to have flowers through September and October, when they will attain perfection in size and color and be ready for exhibition purposes, we may plant the roots or tubers about May 15, and green or growing plants about June 15. As a latitude of one to two weeks may be allowed in either direction, it is obvious that specific planting dates are hardly to be recommended.

These dates are for the middle Atlantic and central states, where killing frosts do not usually occur until late October. In New England, or in the other more northerly states, or in high elevations, where killing frosts may occur by mid-September, it is advisable to plant tubers the first of May, or to set out plants the first of June, just as soon as danger of frost is past.

In the more southerly sections, where planting on any of these dates might result in dahlias reaching the flowering stage during the usual sweltering weather and drought of July and August, it is better to delay planting until after mid-June, or else to plant very early—in March or early April, where that is possible—to bring the flowers in before the hot weather. Late planting, however, is usually much more satisfactory. Early planting is sometimes done with the specific purpose of rejuve-



nating the plants (see page 35) after the hot weather, the strong, vigorous new growth giving an abundance of flowers during late autumn. For exhibition purposes, even as far north as New York, the planting is often delayed until late June, or even well on into July, the object being to secure a few extra fine flowers: such late planting does not, of course, yield satisfactory tuber clumps for the following year.

In setting out green plants, it is important that they should not receive a check while still in the pot, either from becoming pot-bound, or from exhausting the plant food available; it is, therefore, more important to transplant them while they are in good growing condition than to aim at any specific date.

Details of Planting. If the soil has been prepared in the way described in the preceding chapter it will not be necessary to fertilize each individual "hill." Any additional plant food may be supplied in the form of top dressing during the growing season.

If stakes are to be used, they should be put into place before planting. I prefer round cedar stakes to the square painted ones ordinarily used; they last longer and look somewhat more natural. If the natural cedar stakes are not available, standard dahlia stakes may be obtained from your seedsman, or from any lumber concern; they should be an inch and a quarter to two inches square, and six feet long. Cover the lower eighteen inches with creosote paint, and the tops with moss-green shingle stain, or paint. Put them firmly in the ground at least fifteen to eighteen inches deep. Take care to set them in perfectly straight rows, and of an even height, and their appearance, which is ugly at best, will be much better than it often is.

Planting Tubers. Dig a hole six or seven inches deep at the base of each stake. If a number of tubers or plants are to be set, it will save time to make all of these holes before planting. Place the tubers *horizontally,* with the eye or sprout next to the stake, and pointing up. It is advisable, especially in planting early, to cover the tubers with only one to two inches of soil at first. They will start more quickly, and filling in the holes as the plants grow will bury most of the small weeds which sprout.

Setting Out Plants. In setting out plants, place them deep enough for the surface of the root ball to be covered by two to three inches of soil. Remove the lower leaves, if necessary, to do this. Both tubers and potted plants may be set somewhat deeper in light sandy soil than in heavier loam. Four to five inches of soil above the tubers, or two inches above the root balls of green plants, is the proper depth for average garden soil.

Plants which have been grown in a greenhouse should not be changed directly to the open garden; keep them out of doors for several days in a sheltered, shaded place, until they have "hardened off."

CULTURE

I have already mentioned the fact that dahlias must be kept growing constantly, without check, to produce satisfactory results. Where, with many flowers, a check is likely to mean merely fewer or inferior blossoms, with dahlias it is likely to result in none at all. The plants will continue to live, but they will not bloom.

Cultivation. The more often and the more thoroughly the soil around and between your dahlia plants is cultivated, the better blooms they will give you. At the beginning of the season, the soil may be worked several inches deep. After they attain a height of eighteen inches or so, deep cultivation should be stopped, and surface cultivation, to maintain a good soil mulch, used to take its place. For plants in rows, permitting the use of the wheel hoe, I employ the vertical cultivator teeth, for several weeks after planting, and then turn to the hoes, which cut through the soil *horizontally.* When the plants get so large as to interfere with the use of the wheel hoe, an ordinary iron rake, if used often enough to prevent the ground from getting a hard crust, will take care of late season cultivating more expeditiously than any other tool I have found. For working the soil close around the plants, where one cannot get at it with the wheel hoe, a pronged hand weeder, preferably with a long handle to save stooping, will do the work quickly and thoroughly. A hoe will seldom be necessary unless the weeds are allowed to get a considerable start.

Watering and Mulching. The dahlia, because of its structure and the very great foliage area, resulting in excessive evaporation, requires an abundance of soil moisture. Injury from lack of moisture may not at first be apparent, but the gradual hardening of the plant fibers will prove fatal to flower production. Thorough and frequent cultivation early in the season, and the maintenance of a good soil mulch thereafter, will do much toward conserving soil moisture; but, for the finest blooms, it is almost always necessary to employ artificial watering, or mulching, or both.

Many dahlia authorities advocate little or no watering until the plants are ready to bloom. My own experience has been that it is advisable to water whenever the soil begins to get abnormally dry, regardless of the season. The frequently presented argument that watering during the early stages of growth results in developing roots near the surface of the soil, and in soft flabby tissue, certainly does not hold if the watering is properly done. Never "sprinkle" with the hose—it is almost impossible to wet the soil thoroughly in this way. A portable irrigator, preferably of the automatic type, is the best method of watering if one does not have a permanent irrigating system. If it is necessary to rely upon the hose, open a trench along the row of plants, or around each individual plant, six inches or more from the stakes, and allow the water to run into this from the open end of the hose. The spigot valve may be regulated to prevent the water from running in too fast and washing out the soil. The trench should be filled several times in succession until the soil will not readily absorb more water. Then refill the trench with loose, dry soil.

After the plants have attained a height of eighteen inches or so they will begin to require much more water than during their earlier growth. During the blooming period especially, if the soil is allowed to become dry, the plants are likely to receive a check which not only will destroy the flowers that are forming, but will prevent the development of late blooms.

Whether or not artificial watering is resorted to, mulching the soil surface at about the time the first buds are well formed will be decidedly beneficial—especially so to plants which are being grown in beds or borders, where the soil cannot be so readily or thoroughly cultivated as in the rows of plants grown under field or garden culture. It is best to mulch the entire surface of the soil between the plants, but if this is not possible covering twelve to eighteen inches around each plant will be well worth the trouble. Leaf-mold, thoroughly decayed compost, or peatmoss, may be used for this mulching. Better than any of these I like peatmoss and tobacco fertilizer, mixed half and half; this mixture has insecticidal and fertilizing value as well as being a moisture conserver. In the southern and midcentral states, where prolonged, excessively hot spells may be anticipated in July and August, *deep, thorough mulching is especially beneficial.* Straw or shredded cornstalks, four to six inches deep, have proved very effective.

Rejuvenating Non-Flowering Plants. It sometimes happens that plants that have made good growth, and appear to be in good health, refuse to flower satisfactorily. Almost always this is the result of some check—due usually to lack of soil moisture—which has prematurely hardened the plant tissues. At other times, early-set plants will have "bloomed out" long before the end of the season, often due to the exhaustion of the plant food available. If, from whatever cause, a dahlia appears to have gone on strike during July or early August, the only thing to do is to make a start all over again. If there happens to be a new shoot coming up from the base of the plant, the old main stem should be cut off entirely, just above this; if not, cut the top back to within a few inches of the lowest branches, to induce the formation of new shoots. Cultivate, water, and fertilize thoroughly to promote rapid growth. Plants thus "beheaded," as late as the first week in August, will usually give a good crop of flowers before frost. Where dahlias ordinarily bloom into or through October, this rejuvenating process may be resorted to even later. As there already exists a well-established root system, the new top growth is developed with surprising rapidity. For fertilizing this new plant growth, too much nitrogenous plant food should not be employed; rely chiefly upon bone meal and tobacco.

Training, Disbudding, and Disbranching

There is no one point in connection with dahlia growing more generally or more confusingly discussed than that of "disbudding." This is due partly to confusion in the terms used, and partly to a failure to realize that there are several distinct systems of training the plant.

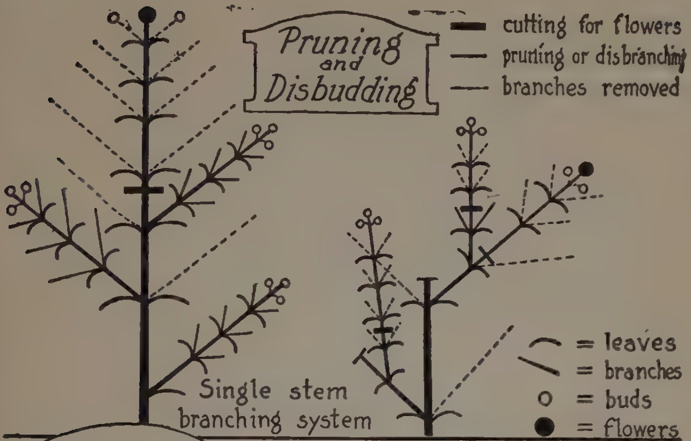
"Disbudding" refers properly only to the removal of flower buds. "Disbranching" is the removal of side branches or shoots, whether these are cut out after they have attained some size, trimmed out as soon as they start, or "rubbed out" as soon as they appear.

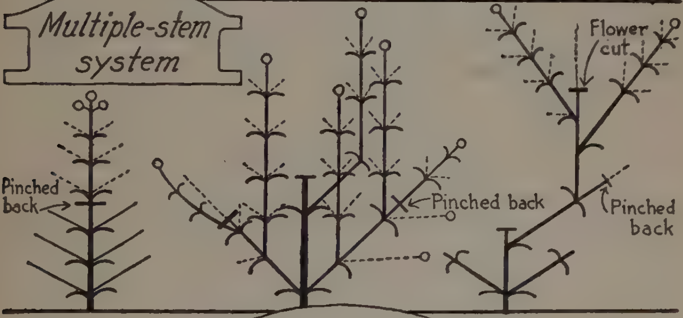
If a dahlia plant in rich soil is left to grow in its own way it will form such a bushy tangle of innumerable branches and foliage that the blooms will be few and inferior in size, on stems but a few inches long, and the growth will quickly harden up, preventing long-continued bloom. To have larger flowers with longer stems, produced over a longer period, we must, therefore, resort to disbudding and disbranching.

Single-Stem Branching System. One method of training the plant is to let the plant grow until the first cluster of flower buds forms at the top. Then the center or terminal bud is left and the others removed. Small branches or shoots will have started in the axils of the pairs of leaves down the stalk; remove these from the several pairs of leaves below the bud (this is disbranching). The result will be a flower with a fairly long, straight stem.

Some of the branches below this point should be left to produce flowers in their turn; these side branches are sometimes called "laterals." If one of each pair is removed alternately (as indicated in the accompanying illustration), the plant will be left with a better balance and proportion. As these lateral branches develop, they should be treated just as the top of the main stem was previously; that is, disbud the tip, leaving only the central bud; and disbranch down to the last (or bottom) pair of side sprouts—which are sometimes called the sublaterals. The sublaterals, in their turn again, are treated in the same way. By this method there will be developed a constant supply of new shoots or branches, the number of which may readily be regulated, yielding a succession of flowers from late midsummer until frost.

Multiple Branching System. Another method of training the plants is to induce a low, stocky, bushy habit of growth by making them form *several main branches near the soil surface,* instead of one vertical main stem. This is done by pinching out the top of the plant, as soon as three or four pairs of leaves have formed. If the tubers have been set deep, and the hollows left above them (see illustration, page 31) have not





Disbudding and disbranching individual main branch

Dahlia plant before disbudding

Same plant after disbudding

been filled in until after these lateral branches have started, the result is a sturdy spreading plant *which will support itself without any staking.* This is often a great advantage in garden or landscape planting. For exhibition purposes, from late planting, often but one flower is allowed on each of the four to eight main branches which develop when the top of the plant has been removed. This will give extra-fine large flowers with exceptionally long straight stems, but there will be little top growth left to develop and mature the tubers in a normal way.

Combination System. These are the two main systems of pruning or training dahlias. Many growers combine them by allowing the first terminal flower bud on the main stalk to develop, but removing all the laterals below it except the two or three pairs nearest the ground. Still another method is to remove *all* flower buds during the summer until after the first of August, usually until about the middle, and after that leave each center terminal bud to make a flower. This is a good plan where blooms are being grown principally for exhibition purposes. The natural habit of growth of the various varieties will have to be considered in whatever system of training is used. Some are inclined to grow very bushy; others, much more openly; some long-jointed, and some short-jointed; some low, and others exceptionally tall. As a general rule, for most varieties, and where medium-sized flowers on fairly long stems for cutting over a long season of bloom is the aim of the grower, the single-stem branching system first described will prove the most satisfactory method.

CUTTING AND HANDLING FLOWERS

When, after weeks of patient care and impatient expectancy, the first dahlia blooms of the season finally open, it is quite natural that we should be in a hurry to cut them. This, however, is a mistake if we would have them at their best. Only after three to six days on the plant, from the time they first open, are they fully expanded. This, of course, is for the decorative, show, and full-centered cactus types. The singles and semi-doubles naturally attain their maximum size more quickly. Contrary to what might be expected, *fully opened flowers will last longer when cut than those which have just begun to open.*

Cut with as long stems as it is possible to get. If the plants have been kept disbudded and disbranched, as already described, each blossom will have a fairly long stem. If this work has been neglected, the flowers should be cut with several pairs of leaves anyway, as this incidental pruning is desirable to develop the growth of new branches fairly low down on the plant.

The flowers should never be cut during the heat of the day. For home use, it is best to gather them very early in the morning, before the dew is off. If they are to be shipped, or used for exhibition, they should be cut the preceding evening, or even the preceding morning. As the stems are fleshy and easily bruised, always cut with a sharp and fairly heavy knife; light pruning shears are convenient where a considerable number are to be gathered. Cut just above a joint, so as to leave the stalk with an open end. Clip off the lower leaves immediately, and, as soon as possible, plunge the stems deep into cold water. It is well to carry a pail of water along when cutting. The blooms should be kept for at least two or three hours in a cool, dark place, such as a cellar, before being put in vases, or prepared for shipping. If the floor and walls of the cellar are sprayed with water, the resulting rapid evaporation will lower the temperature several degrees.

Shipping. Even the amateur will, occasionally, wish to send away some of the fine blooms, which he may justly be proud of having produced. What more happy gift for relatives in the city or, perchance, a friend in the hospital? And yet how often the beautiful blooms, packed with the most painstaking care but in ignorance of how the job should be done, arrive at their destination either wilted beyond recovery, or a half-decayed mass which can only be thrown into the ash can with the regretful comment, "How beautiful they must have been!"

To begin with, the flowers should never be shipped until, by treating them as described above, the stems have had a chance to absorb all the water possible. Secondly, they should always be perfectly *dry* when shipped. The practice, prevalent among amateurs, of sprinkling the blooms when they are packed, is bad for most flowers, but almost fatal for dahlias. If the blooms are to go a long distance, and the weather is hot, the stems may be provided with additional moisture by wrapping the base of each, up to the lower leaves, in moist soft tissue paper, or sphagnum moss, held in place with waxed tissue paper secured by light twine or rubber bands. Another method is to singe the ends of the stems, when they are taken from the water in which they have been standing, in a hot flame. A can of solid alcohol will be found most convenient for this purpose. Ordinarily, these extra precautions will not be necessary for flowers going on a day's journey.

If you are going to attempt to ship flowers at all, make a success of it. This means merely the investment of a few cents in florists' shipping boxes, which are made of heavy corrugated cardboard, and in a dozen or two sheets of florists' waxed tissue paper. These supplies may be bought from any local florist, and from most seed houses or department stores.

Line the box with a double thickness of waxed paper, letting it extend over the sides and ends sufficiently to form a covering after the flowers are put in. Select the longest-stemmed specimens, and pack them snugly, so they will remain in place, but without crowding tightly. Place the longest-stemmed flowers at the ends of the box, and gradually fill in with shorter and shorter stemmed ones, until the bottom layer is full except at the center. If you wish blooms to travel in perfect condition, or for exhibition purposes, it is best to wrap each individual flower in waxed paper. Those with very large heads should have the stems supported with a layer of tissue paper, or with small pieces of newspaper twisted into loose rolls. The stems may be held in position by securing them to the bottom of the box with soft twine, using a harness or upholsterer's needle. Light wooden cleats, secured to the sides of the box with flat-headed nails such as are used for asphalt roofing paper, are sometimes employed, and these will form supports for a second layer of flowers if the box is sufficiently deep.

In shipping it should be kept in mind that the decorative dahlias usually travel very much better than either the show or the cactus. The singles and semi-doubles are easy to pack but do not last as long as the others.

Care of Cut Blooms. I have read of and tried many methods of prolonging the lives of the flowers after cutting, such as scalding or burning the ends of the stems, and placing in the water ammonia, soda, aspirin tablets, or strychnine. Personally, I do not believe that any of them are worth bothering with. Usually, when questioning any one recommending these things, I have found that he has never made any *comparative* trials: he has merely assumed that the results which were obtained were due to the treatment. I know of no better method for keeping the blooms than to prepare them as already suggested; place them in water kept as cool as possible and renew it each day, at the same time cutting off an inch or so of the stem with sharp knife or scissors, making a clean cut which will not crush the tissue of the stalk. Under these conditions, the longest-keeping dahlias will last for a week, possibly a little longer. There is considerable difference between varieties, even of the same type, in keeping qualities. Flowers exposed to a constant draft will "go down" quickly, despite any precautions which may be taken. Keep this in mind in placing vases about your rooms.

Reviving Cut Blooms. Flowers which have wilted, from remaining too long out of water, exposure to draft, or other causes, may be revived considerably by plunging the stems for ten minutes into hot water—just below the boiling point—cutting two or three inches off the stems, and then placing deep in fresh, cold water. A small amount of strychnine added to the latter sometimes accelerates the revival. Dahlias with faces thus "lifted" will serve well enough for use around the house, but are not desirable for shipping or showing.

Suggestions as to the arrangement of flowers for decorative purposes have already been made (see page 15). Late autumn treatment is taken up in a following chapter.

CHAPTER V

INSECTS AND DISEASES

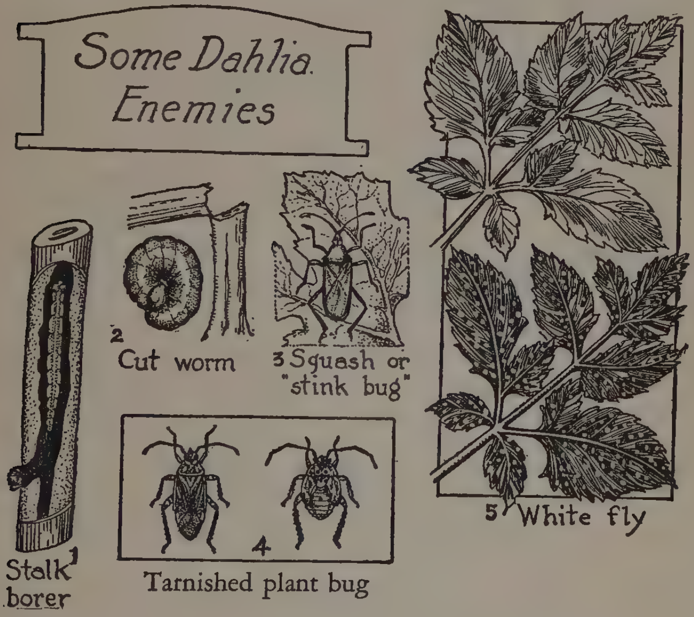
Before introducing the reader to the list of undesirable citizens whom he may encounter at one time or another in his dahlia garden, I should like to cheer him with the information that none of them is likely to prove fatal; and also to warn him that many dahlia troubles, for which he is likely to blame either insects or diseases, often have their actual cause in some weak spot in the cultural methods used, the plant pests being only supplementary, and sometimes merely coincidental sources of trouble.

Take, for instance, the disease known as "stunt." There has been a great deal of argument as to whether this is actually a disease. Certain it is that other things than this disease, if it is one, do cause a stunted condition of the plant which is very similar to it. Lack of available plant food, a baked, dry soil, poor drainage, resulting in the exclusion of air about the roots, root injury from fertilizers, and the attacks of some insects, especially thrips and leaf hoppers, are the direct causes of this abnormal dwarfed condition of growth often considered to be stunt disease.

Be sure, therefore, that your growing conditions are right in *all* details before you assume that insects and diseases cause such failures as you may encounter.

Insects

Dahlia Stalk Borer. Sooner or later almost every one who undertakes to grow dahlias will encounter this aggravating intruder. His presence is first indicated by the wilting of the top portion of the main stalk, upon the inner lining of which, tunneling up or down, he feeds. Examination will usually show the hole through which he has entered in the section of the stalk just below the wilted portion. A lengthwise slit in the stem, made just above the joint, will usually reveal him. He can be killed where he is, or extracted. The slit, if tied up with raffia for a few days, will generally grow together. Another method of control is to insert a few drops of carbon disulphide or carbon tetrachloride into the hole with a medicine dropper, and plug the opening up tight with damp soil or a bit of chewing gum. A weak solution of arsenate of lead may be injected into the stalk, but the carbon gas is quicker and just as good.



The stalk borer, which attacks many perennials besides the dahlia, usually starts life in May, in the stems of grass or weeds. The thorough cleaning up and burning of any dead plants or rubbish in the garden, where the eggs could winter over, greatly reduces the danger of attack from this pest.

Corn Borer. This comparative newcomer, fortunately not yet prevalent in all sections, attacks ornamental plants, including the dahlia, as well as many farm crops. The thorough cleaning up and burning up of weeds, grass, cornstalks, old tops of perennials, and so on, in late autumn, is the control suggested.

Cutworm. Our old friend from the vegetable and flower garden is so modest that he hides himself in the dust after having accomplished the feat of chewing off one of the choicest plants in a collection. Do not give him a chance to repeat the operation. Search about the base of the plant will usually reveal him. The use of a poison bran bait, or one of the several "cutworm foods" now on the market is the standard method of control. My friend, J. A. Kemp, well-known veteran of the dahlia game, suggests protecting the dahlia garden by dropping small pieces of poisoned bait, the size of a walnut, every six feet or so each way, *one week after* the garden has been plowed or spaded in the spring, when the cutworms are ravenous after working their way up through the soil. The poison bait should be applied at dusk, as the worms are night feeders. The recipe for it is as follows:

> One-quarter pound white arsenic to a peck of bran or "shorts." Mix these together dry. To this dry mixture add, a little at a time, a gallon or so of water, in which a pint of cheap molasses has been thoroughly stirred. After standing for a few hours, this will be ready to apply by scattering in small "gobs," so that it will not dry out too quickly. Arsenate of lead or Paris green may be used in place of the white arsenic if more convenient.

White Grubs. These fellows, the larvæ of the June beetles, sometimes eat off the new roots, if dahlias have been planted in ground which was in sod the year previous. The plants may be taken up and replanted, placing plenty of peatmoss in the soil to induce the formation of new roots. Where care is exercised not to plant on sod soil, they seldom cause trouble.

All the pests above mentioned attack the roots or the stems of the plant. They are not, on the whole, so serious as the following, which attack the foliage.

Thrip. These tiny gnat-like intruders, scarcely visible to the naked eye, feed upon the surface of the leaves, especially in the tip of the shoot, sucking the plant juices. They do not appear until the advent of hot weather, usually the latter part of May or June, and then multiply with amazing rapidity. Spray, preferably during the heat of the day, with the nicotine spray Black Leaf 40, adding an ounce of fish-oil soap, thoroughly dissolved, to each gallon of spray. Kerosene emulsion is sometimes used, but is less effective. Asphixo, a suffocating dust, which penetrates the partly folded leaves, makes a thorough job, but must be applied with a forceful duster. Whatever spray or dust is used must be repeated at least once a week, preferably twice, until the plants are cleaned up. Give the foliage a thorough rinsing or spraying with plain water, the day after each spraying or dusting.

Small-leaved varieties are much more susceptible to thrip injury than the large-leaved sorts, and are often "stunted" from this cause. It is well to dust or spray them even before the insects appear, as a precaution. Choice plants may be protected by covering them with tobacco cloth or fine muslin, supported by light wooden stakes.

Leaf Hopper. While this pest is considerably larger than the thrip, he may be present for some time before being noticed, as he keeps to the underside of the leaves. He usually appears later than the thrip, about the first of July, and does greatest injury during very hot weather. Tobacco dust or asphixo will be found more effective than spraying, as the hoppers cannot get away from it so readily. Use the methods of control suggested for thrip.

Tarnished Plant Bug. This fellow, who fortunately does not very often appear, sucks the sap from tender shoots, and also probably injects a poison substance into the tissues, causing the affected part to turn brown and eventually to fall, and the plant to assume an abnormal stunted appearance. The young bugs, which may appear at any time from May until late fall, are yellowish green. Use nicotine spray as suggested for thrip, and also clean up in the fall to destroy the eggs.

White Fly. These very tiny winged white flies are innocent enough to look at when they first appear. But they hide under the leaves and breed rapidly, the young wingless "nymphs" sucking the plant juices; if they are left undisturbed, there will soon be clouds of these tiny insects in evidence when the portion of the plant where they lodge is disturbed. They interfere with the foliage development and also cause malformed flowers. Employ the remedies suggested above, being sure that any spray used directly hits the insects on the undersides of the leaves. Spraying merely the surface is of little use.

All four of the pests mentioned above cause abnormal growth in the plants, resulting in stunted or twisted or curved leaves, and sometimes this dwarfed appearance is mistaken for disease, which, at least in the case of the leaf hopper, may be actually transferred to the plant. As all four are controlled by the same method, the easiest and safest way to keep your dahlias growing vigorously is to begin spraying about the middle of June, repeating regularly once a week, and preferably oftener if any insects appear. It is really less trouble to do this than to attempt to eradicate any one of the pests once it has obtained a strong start.

Aphids. The green plant lice, which attack so many garden plants, do not spare the dahlia. Fortunately, they are among the easiest of all to control, as Black Leaf 40 will quickly clean them up. As they are most likely to congregate at the tips of the new growth, which is easily injured by a spray, use a rather weak solution—one teaspoonful to six quarts of water.

Red Spider, or "Mite." These minute pests sometimes appear in very hot weather in sufficient numbers to cause brownish spots on the foliage. With a small glass, the mites, their whitish casts, and the eggs may readily be discerned. A forceful spraying with cold water will usually keep them under control; if this fails, spray with linseed-oil emulsion, made of 1 pint raw linseed oil, 1 pint of water and ¼ lb. soap flakes.

This stock preparation is diluted with 50 parts of water before applying.

Beetles. Various beetles attack the dahlia, but they seldom do any very serious damage or injury to the plant. These include the well known blackish brown squash bug or "stink bug," the spotted cucumber beetle of the vegetable garden, and also the buffalo beetle. The surest, and on the whole, the simplest method of controlling all of these, where a limited number of plants is being grown, is to knock them off into a tin can containing a little kerosene. For convenience, the can can be nailed to a short wooden handle. A thin paddle, made from a piece of shingle, is used in the other hand. Very early in the morning, when they are least active, is the best time to go after them.

DISEASES

The dahlia is quite free from any serious diseases of either the plants or the foliage. With the exception of the so-called "stunt" disease, of which we have already spoken, little trouble along this line is to be anticipated.

Mosaic. This is an actual but an obscure constitutional disease, something like the dwarf curly disease of potatoes, which is transmitted in the tuber. The dwarfed, deformed plants are subject to sunburn or browning, and the flowers, if produced at all, are poor. Though this disease was first reported nearly ten years ago, by Prof. J. B. S. Norton, little is yet known concerning it, and there is no remedy. Apparently it does not infect the soil; but the diseased plants should be removed and burned, if the grower is satisfied that the condition has not been caused by moles, insects, poor cultural conditions, or the planting of shriveled tubers (see page 56).

Plants grown from strong healthy cuttings are much less subject to mosaic, or to a stunted condition of growth, than those from tubers. If a plant which is beginning to show a stunted condition is immediately taken up, the top growth cut back, the diseased portion of the tuber, if any, cut away, the surface dusted with sulphur or Semisan, and the plant replaced—with the addition of peatmoss to induce the formation of new roots—healthy top growth and normal blossoming will often result.

Powdery Mildew. This often affects some of the lower leaves of susceptible varieties, but seldom does any real damage. It may be controlled by the use of Bordeaux or lime-sulphur, after removing the infected leaves.

Root Rot. This occurs in some sections, but it seldom if ever attacks *sound* roots under proper storage conditions, the fungus needing a break or cut in the surface to obtain a foothold. Roots in storage which show any sign of decay should be cut back to sound flesh, dusted with flowers of sulphur or Semisan, and stored separately.

In general, it should be kept in mind in combating insects and diseases that the free circulation of air about the plants at all stages of growth is one of the essential requirements of the dahlia. Don't allow your plants to grow thick and bushy; provide sufficient moisture to maintain steady growth; cultivate frequently; and neither insects nor diseases will be likely to cause serious trouble.

CHAPTER VI

HARVESTING AND KEEPING OVER WINTER

In its native habitat, the dahlia is not checked suddenly in its full growth by frost, as it is with us. It gradually matures, ripens, and dies down with the advent of the rainless season. The bulbs are stored over winter, by Mother Nature, in the fine, dry soil.

In many sections of the United States we are likely to have a light frost, just sufficient to nip the dahlia tops, followed by two or three weeks of perfect dahlia weather. If one will take the trouble to give the plants, or some of the choicest specimens, the protection afforded by a "tent" of plant-protecting or tobacco cloth, or of cheap unbleached muslin, not only may the flowering season be prolonged, but the roots as well will be benefited.

If an irrigating system is available, spraying with cold water very early in the morning, after a light freeze, will often save at least a large part of the plants—unless the sun comes out so bright as to make it impossible for them to thaw out gradually. If the tops are then cut back to uninjured growth, often many of the flower buds will have an opportunity to develop before freezing weather returns.

About the middle of September, top dressing or fertilizing should be stopped, and no further watering done unless there is a period of actual drought. Even cultivation should cease. The objective is to ripen up the plants as much as possible before the roots must be harvested for winter storing. If, after the early part of October, the flowers get smaller and some of the double ones begin to come with open centers, that is but natural, and it is a mistake to try to force the plants to overcome it.

WHEN TO HARVEST

In most sections, the problem as to when to take up the bulbs is settled for the grower by Jack Frost. When his unwelcome visit has blackened the dahlia tops, without any chance of revival, the plants may be allowed to remain in the soil for several days—but preferably not longer than a week—so that the tuberous roots may reabsorb the plant fluids from the tops. However, if there is any danger of their "freezing in," they must be taken up immediately. If the number of plants is not too great, and a cold-frame or shed is available to place them in, the main part of the stalk may be left attached to the clump for the time being.

When frost is delayed until exceptionally late, the roots should be taken up without waiting for the tops to be killed back, as there is danger that the first freeze will be so severe as to injure the tubers, or at least the new eyes about the collar, in the ground. Frost injury, not perceptible at the time, is often the cause of the tubers decaying in winter storage. October 15, south of Boston; November 1, south of New York; and November 10–15, south of Philadelphia, is about as late as it is safe to delay digging even if there has been no killing frost. In higher altitudes and farther inland, the dates should be from one to two weeks earlier for the same latitude.

HARVESTING, OR "LIFTING," THE TUBERS

The first step in harvesting is to remove the tops. Cut them just above the soil with a fairly heavy but very sharp tool, such as a sickle or a corn knife, which will make any hacking or yanking unnecessary. Throughout the entire process of harvesting and storing every precaution should be taken not to break or even strain the tops of the tubers, which are quite tender and brittle.

Remove the label from the stake and fasten it, with a wire, *through* the top of the stalk. Whether the digging is done by one person or by two—which is very much easier—some of the soil should be removed from around the root clump before lifting it from the soil. I use a spade for this preliminary digging, and a broad-tined fork for taking the crop out; if accidentally a root be hit, the spade will make a clean, sharp cut, instead of the jagged tear caused by the tine of a fork.

The root clump should be lifted out with the fork; never attempt to pull it out by the remaining stem, as this is almost sure to break or injure some of the tuber-necks. After removing the clump from the soil, turn it on its side so that the hollow stem can drain out. If the tubers are very small, or very long and lean, allow as much soil as possible to remain with them in the process of digging. Small or thin tubers are much more likely than big fleshy ones to dry off and shrivel during the winter: keeping some of the soil about them will help to bring them safely through. Allow the tubers to dry off for an hour or so in the sun, as you would potatoes, and then remove them to temporary storage quarters—anywhere safe from drying wind and from frost.

STORING

With many, the winter storing of the roots is the most critical point in dahlia culture. Several different methods are used and recommended both by experts and by amateurs. The "best" method is the one which works—for *you,* or rather for your particular conditions.

Whatever method may be employed, the objective in storing dahlia roots is to prevent them, on the one hand, from drying out and shriveling; and on the other, from keeping so moist that they will decay. On the whole, it is better to err in the direction of dryness than of moistness. If they are examined from time to time, as they should be, when they are in storage, it is much easier to bring back to normal condition the roots which have begun to dry out, than those which have begun to decay.

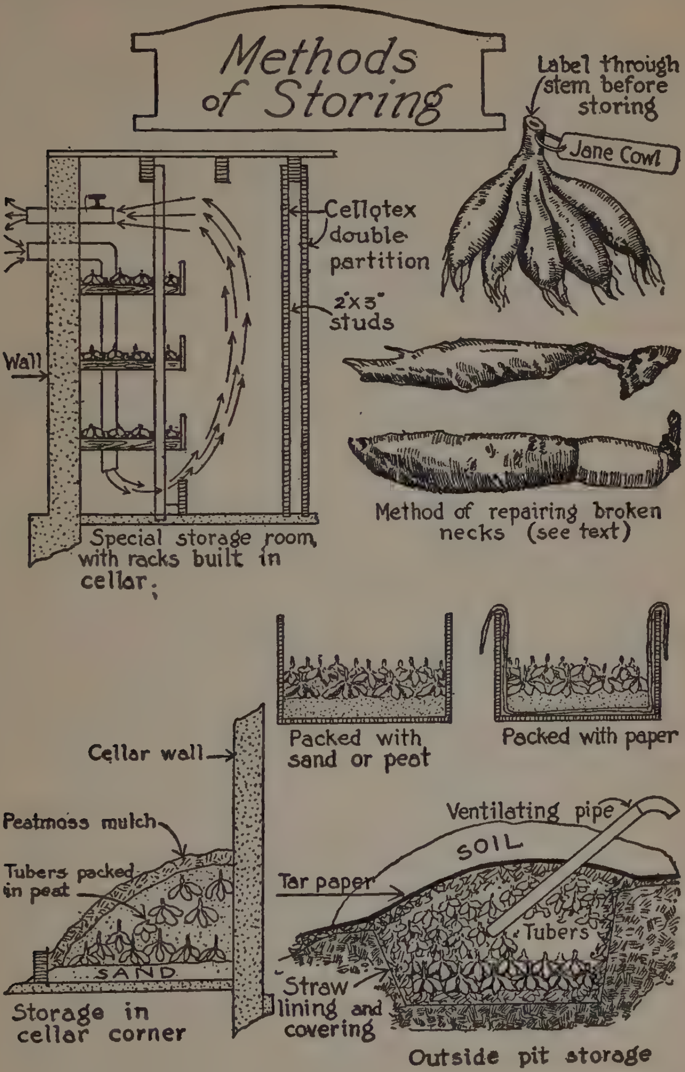
Preparation for Storage. Whatever method of storing is to be used, the bulbs should be examined carefully, and any which show mechanical injury, bruises, broken necks, decay, or diseased spots should be discarded. It is well also to separate any with small or slim tubers from the others, as extra precautions must be taken to prevent these from drying out. If all broken, injured, or diseased spots in dahlia tubers be cut off or cut out clean, to firm flesh, and the cuts dusted with flowers of sulphur, they will usually keep perfectly.

Temperature. The temperature for storing dahlias should be kept as near 40° as possible, though often it is nearer 45° or even 50°. If there is any danger of its falling as low as 32°, the packing around the bulbs should be such that it will protect them, temporarily at least, from frost injury.

It is always advisable to have a thermometer near where one's dahlias are stored. Even if it is of the cheapest sort, it will be much more accurate than merely guessing; when one knows definitely that the temperature is higher or lower than it should be, it is much more likely that something will be done to correct it.

Storage on the Cellar Floor. The simplest method of storing is to store the tubers in a heap in a corner, or against the cellar wall, first placing a four- or five-inch layer of clean, fresh sand as a foundation. This may be held in place by a plank set on edge. The tubers should be packed, as they are placed away, in dry sand or peatmoss, with a five- or six-inch layer over the whole when the pile is finished. This method will often prove satisfactory in cellars found suitable for storing vegetables and fruits, especially if there is a dirt rather than a concrete floor. However, it is not as safe as the following method.

Packing in Boxes. Perhaps the most commonly used and the most generally satisfactory method of storing the tubers is to secure, or make, a number of boxes in which to pack the clumps of roots. A convenient size for these is thirty by twenty by fifteen inches deep; but any size not too big for convenient handling will answer. Boxes are better than barrels, as the latter do not permit ready examination of the tubers, and some of the lower clumps are likely to be injured by the weight above them.


Methods of Storing
Label through stem before storing
Jane Cowl
Celotex double partition
2"x3" studs
Wall
Special storage room, with racks built in cellar.
Method of repairing broken necks (see text)
Packed with sand or peat
Packed with paper
Cellar wall
Peatmoss mulch
Tubers packed in peat
SAND
Storage in cellar corner
Ventilating pipe
SOIL
Tar paper
Tubers
Straw lining and covering
Outside pit storage

Some growers advocate lining the storage boxes with several thicknesses of newspaper, or with heavy building paper, letting it extend up over the sides, so that it can be readily folded over the roots, which are put away with some soil adhering to them, but without any packing about them. But it is best to put sand or ashes under the bottom layer. If the tubers appear to be drying out too much, the paper covering is moistened, from time to time, and if they begin to show mold, indicating that there is too much moisture, they are repacked and the paper covering is opened up to admit more ventilation.

Another method is to pack the roots in clean sand, sawdust, dry soil, coal ashes, or peatmoss. Whatever material is used should be dry, but not dust-dry. Personally I prefer peatmoss (not lumpy, but well granulated) to any other material for packing. It is one of the best of all insulators against both heat and cold, and so porous as to absorb any moisture given off by the tubers, without itself becoming damp.

Some growers advocate placing the clumps of roots upside down or on their sides. I have never found this necessary if the tops have been thoroughly drained, as already described, for storing. They are more likely to become injured than if packed right side up, the stems making convenient "handles" if reasonable care is used in lifting them.

Paraffin Treatment. A method of keeping the tubers sometimes advocated is to give them a thin covering of paraffin. This may be worth while for very thin tubers, of rare varieties, which it might be difficult otherwise to keep. It is hardly practicable for general use. The tubers should be thoroughly cleaned, and dipped in melted paraffin. The latter should be kept considerably below the boiling point, so that it will leave a white covering a fraction of an inch thick; if the covering is thin, and looks like a coat of varnish, the liquid paraffin is too hot. Instead of dipping the tubers, you can apply the paraffin with a brush. I have never tried this method, as I find it possible to keep even thin tubers by packing them in boxes in *slightly* moist peatmoss.

Special Storage Room. If one has quite a number of valuable varieties, and only a modern cellar, with a concrete floor and a heater, in which to keep them, it will decidedly pay to go to the slight expense necessary to fit up a special storage room. Light studs, two by three or two by four inches, may be run from the floor to the ceiling to support sheets of celotex nailed inside and outside, leaving a hollow air space between. If two pieces of stovepipe are run through a window or through the wall, the lower one extending down near the floor, the temperature and ventilation can be quite perfectly controlled, the upper pipe carrying out the moist, warm air. The arrangement of such a special storage room is illustrated in one of the drawings on page 53.

Outdoor Storage. In warmer sections, south of Washington, D. C., where the ground is not likely to freeze more than three or four inches deep, and where many tubers are grown, they may readily be stored in an outside pit, such as is used for vegetables. This should be located in a thoroughly well-drained place, lined with straw or leaves, and then covered, after the roots have been put in place, with waterproof tar or roofing paper, held down by a layer of soil. Another layer of straw, with soil on top of it, may be added on the approach of severe freezing weather. If many roots are to be stored in one pit, a ventilating pipe with holes punched in the lower end may be inserted to carry off any moisture from the roots, and to provide ventilation. The opening in this pipe should be closed during severe cold weather.

Whatever method of storing is used, it will pay to examine the roots two or three times, preferably oftener, during the winter, to ascertain if they are keeping properly; if they are not, change the storage conditions accordingly.

TREATMENT OF THE BULBS IN SPRING

At least two or three weeks before planting time, take the roots from their winter quarters, go over them carefully, discard or treat any which may show signs of decay, and place them in a somewhat warmer room. It is a good plan to moisten them so that the eyes will sprout just a little before you separate the clumps for planting.

If too high a storage temperature has been maintained, and the eyes have begun to sprout, they should be carefully cut back to the first joint, to lessen the danger of their being broken off altogether in handling, as in this event the tuber will be rendered useless. (See page 26.) Dividing the roots will temporarily somewhat check the sprouting; but the divisions should be packed in peatmoss or sand and kept as cool as possible. Any roots showing a tendency to shrivel should be packed in sand or somewhat moist peatmoss and allowed to "plump up" before planting time.

Sprouting Before Planting. In the more northerly states, where the growing season is short, it is often desirable to get a running start by dividing the roots four to five weeks before planting time, and starting them in pots in a cold frame or in a sunny window. A light soil, containing plenty of fibrous humus in the form of leaf mold, chip dirt, or peatmoss, is desirable for this purpose, as the plants may be shifted to the open ground without the root balls crumbling. The new pots made of compressed peat are excellent, as pot and all are transferred to the ground in planting, thus avoiding any disturbance of the roots.

Repairing Broken Necks. It occasionally happens that a tuber of a valuable variety breaks or cracks at the neck despite all our care in handling it. Such a tuber may be repaired by the following "operation," which it is not difficult to perform:

Wash off the wound on the neck of the tuber; take a piece of fairly stiff, but pliable, copper wire; insert one end in the body of the tuber, and with the other secure the neck in a firm position with two edges of the break tight together. Cover the neck with a "cast" of plaster of Paris, mixed with just enough water to permit its being "worked" readily, and applied with a putty knife or an old table knife, being careful, of course, not to cover the eye. (See illustration on page 53.) Place in moist peatmoss until growth starts.

CHAPTER VII

PROPAGATING AND HYBRIDIZING

PROPAGATING is increasing the number of plants of a variety which we already have: hybridizing is crossing or breeding existing sorts to obtain *new* varieties. Every dahlia grower is immediately interested in the former. Sooner or later, if he becomes a real enthusiast, he is likely to become interested in the latter.

METHODS OF PROPAGATION

There are several quite different ways by which the grower may increase the supply of dahlias he starts out with. These include growing from seed; growing from the tuberous roots which the dahlia plant forms underground, usually several for each old plant; growing from cuttings—parts of the plant cut off and induced to form roots, thus making new plants; and growing by means of grafts—sometimes used in increasing stocks of expensive new varieties.

Seeds. As the dahlia does not "come true" from seed, this method is little employed. The beginner may find it interesting and worth while to grow a lot of seedlings, either from his own or from purchased seed, especially where it is desirable to secure a large quantity of singles or of semi-doubles. The most attractive of these, of course, may be kept for future use. Growing from seed is not difficult, and the plants will flower freely the first season. (For details of growing from seed, see page 68.)

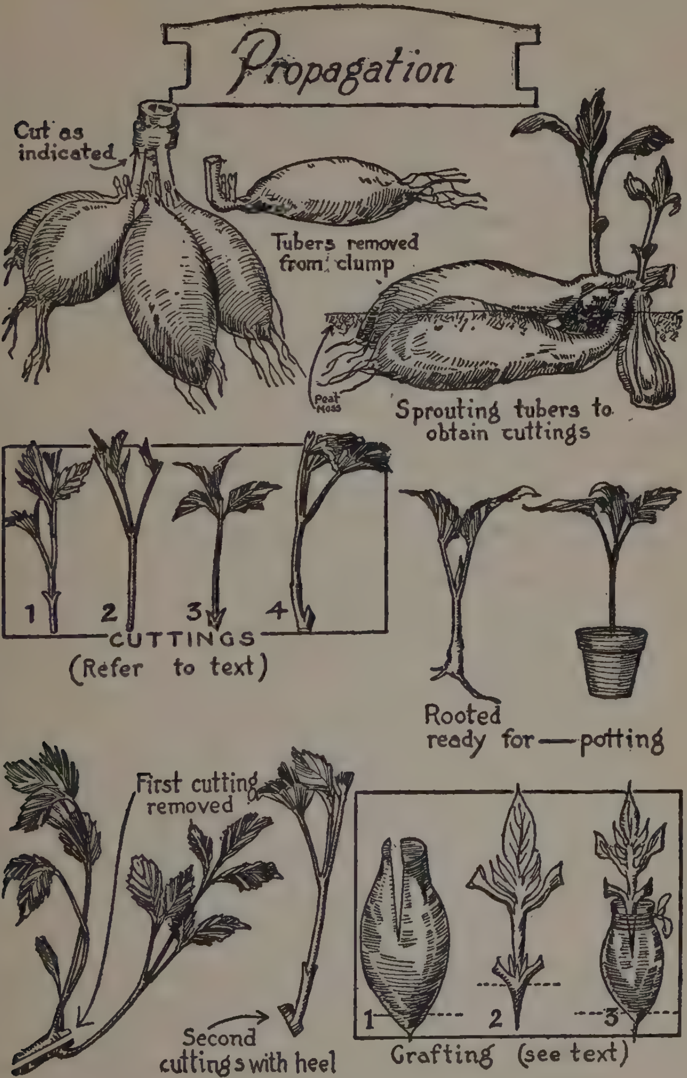
By Division. Under normal conditions, each dahlia root planted in the spring will produce a clump or cluster of tubers by autumn. Each individual tuber in the clump will make a plant the following spring; in fact, whether one wishes more plants of a variety or not, the entire clump should never be replanted.

As soon as the eyes have started sufficiently to be plainly discernible in the spring, carefully cut apart each clump of tubers, taking care to secure one or two eyes with each tuber, as illustrated on page 59. A "blind" tuber—one having no eye, or an eye which has been so injured that it will not sprout—is worthless, as it will never form a plant. If a tuber has two eyes, and the neck is sufficiently thick, it may be cut in two *lengthwise, when planting,* leaving one eye to each piece; these "half-portions" will make perfectly good plants, but, except in the case of new or rare varieties, such small divisions are not needed.

Sometimes it is not possible to tell to which of two tubers an eye belongs; in this case, leave both attached to the portion of the crown containing the eye. Quite likely another eye will develop later, and the tubers may then be separated.

Large tubers are no better than moderate-sized, or even small ones, provided the latter are round and plump. Very large tubers, in fact, are a distinct detriment, as the new plant is likely to rely upon them for nourishment, instead of making roots and new tubers of its own. Always cut away one- to two-thirds of such extra-large tubers when planting, dusting the cut surfaces with sulphur. It is best not to do this, however, until just before planting. (See page 27.)

Making the Divisions. Clean the clumps thoroughly by rinsing them in a tub of water or turning the hose on them. This makes it possible to see much more clearly just where they should be cut. Have available a very stout, heavy knife, or a pair of pruning shears or a small saw, and also a fairly flexible bladed knife such as a good quality vegetable paring knife. All should have keen edges, as the old stems and crowns are tough and fibrous, and a ragged cut may mean the loss of a valued plant. First cut off the old stem above the crown, or the topmost eye; next cut off the most readily get-at-able tuber, with its accompanying eye or eyes, and a section of the crown


Propagation
Cut as indicated
Tubers removed from clump
Peat Moss
Sprouting tubers to obtain cuttings
1
2
3
4
CUTTINGS
(Refer to text)
Rooted ready for — potting
First cutting removed
Second cuttings with heel
1
2
3
Grafting (see text)

and old stem. Proceed then as indicated in the sketch at the top of page 59.

After the divisions are made, they should be carefully labeled and put away in dry sand or peatmoss, and in a cool place, to hold them as they are until planting time; or slightly moist, in a temperature of 50° to 60°, if it is desired to develop the eyes still further.

Pot Roots. This method of propagating is discussed under hybridizing (see page 60).

Propagation by Cuttings. From three to six or eight, occasionally ten or twelve new plants may be obtained from one old one by the method of division described above. With new, valuable or rarer varieties, it is often desirable to increase the stock more rapidly than this. Recourse is then had to cuttings which, after being rooted, are potted up, providing growing green plants for setting out. By making cuttings, it is possible to get three to five, or even more plants from almost every eye or sprout which the crop of tubers can support.

This additional increase is not the only reason for growing plants from cuttings. They make it possible to time more accurately, for exhibition purposes, the production of superior blooms. Also it has been the experience of many growers that good green plants will start off more vigorously than plants from tubers, are much less subject to the dwarfed or stunted condition described on page 42, and produce tubers of better quality, even if they may not be quite so large. Moreover, it is possible for commercial growers to offer green plants of new varieties at about half the price of tuber divisions.

To obtain the material for cuttings, take the clumps of tubers from winter storage in February or March and half bury them—*not* covered up—in moist sand or peatmoss, placing them in the bench in the greenhouse, or in flats if they must be started in the house, or in a hotbed or cold frame. Keep them in full light, so that the new shoots will be short and stocky. (See illustration on top of page 59.) For the amateur, who is not under the necessity of producing the greatest number of plants possible, I would suggest what I call the "three-cutting system," which will give three strong stocky plants from each eye. When the first shoot is well developed, but before the leaves get too large, cut it out just below the second joint: this will permit the development of two more cuttings from the axils of the leaves which are left. When these are large enough, cut this sprout off half an inch or so below the joint, the piece of stem being slit in two lengthwise, giving two strong "heel" cuttings—that is, cuttings with a "heel" or piece of the stem attached to the base—which are the easiest to root and make the strongest plants. This system will give from twelve to twenty-five vigorous, strong plants to each clump of tubers, ample for the requirements of the average amateur. Discard the old tubers entirely after the cuttings are taken. If you desire to grow plants from the tubers, in addition to the cuttings, take the first cutting just below the *third* joint of each sprout; then when the two heel cuttings are removed, as just described, there will still remain two shoots to grow when the tuber is planted out.

Preparation of Cuttings for Rooting. If a cutting is made *between* the joints on the stem (see cutting No. 1, page 59), the resulting plant will grow and flower satisfactorily but will not make eye-bearing tubers. The cuttings should, therefore, be made just at the joint (see cutting No. 2), or immediately below (see cutting No. 3), which is better, as roots start both from the joint and from the base of the cutting. Surest of all, both to root and to produce good tubers, is a "heel cutting" (see cutting No. 4)—one taken with a portion of the stem. The larger leaves should be cut back one-half to two-thirds, to prevent wilting and to allow free circulation of air.

Rooting Cuttings. The cuttings may be rooted directly in a cutting bed in a greenhouse, if one is available; if not, then in flats three to four inches deep. Sand is often used, but a mixture, half sand and half peatmoss, will give better results, especially where greenhouse facilities are not available. Insert the cuttings firmly to about half their length, and two to three inches apart, in rows three or four inches apart. Give a thorough watering to settle and moisten the soil; after that water often enough to keep the soil just sufficiently moist to prevent the cuttings from wilting. An occasional syringing or spraying of the tops, on the mornings of bright sunny days, will also help to prevent wilting.

Keep the cuttings in a temperature of 50° to 60°. (Some commercial growers use a temperature considerably higher than this, to force the growth: the resulting plants do not produce satisfactory tubers, and cause merited dissatisfaction by the purchaser.) If in a greenhouse or a hotbed, mild "bottom heat" will induce them to root more quickly. Cheesecloth or some other light shading should be provided to protect them from bright noonday sunshine. Ventilate as often and as long as possible while maintaining the required temperature, as a close atmosphere is likely to cause "damping off"; this, however, is less likely to occur in a peatmoss mixture than in pure sand.

Transplanting the Cuttings. After two or three weeks, under favorable conditions, the cuttings will begin to root. Some of them will take considerably longer than others. As soon as the roots have attained a length of half an inch to an inch, they should be removed from the cutting bed, and placed in flats three or four inches apart each way, or in individual pots—not larger than three inches to start with. A moderately rich potting soil, say two parts garden loam and one part each peatmoss and thoroughly rotted *old* manure, should be used. If no old manure is available, add a small quantity of bone flour to the potting soil—a moderate handful to a peck of the compost. If pots have been used, plunge them to the rim in ashes or peatmoss, to keep them evenly moist. Pots are usually recommended, but perfectly good plants may be grown in flats, with less bother and greater economy of space. Do not water too freely, but provide shade from the bright midday sun. Always give plenty of air. Lack of adequate ventilation is the biggest single cause of weak, spindling plants, such as are so often seen, and which prejudice so many growers against green plants. As soon as possible, the young plants should be transferred to a cold frame to grow on slowly; and they should be thoroughly hardened off before being set out in the field. Potted plants, if started early, may require a shift to larger pots before being set in the open. Do *not* permit the roots to become "pot-bound." This is harmful to any plant, but almost sure to cause permanent injury in the case of dahlias.

Sometimes, where there is no greenhouse or frame available, the cuttings are rooted directly in small pots. Fill a three-inch pot—preferably a "rose" pot—about one-third full of the potting compost, suggested above, and over this place a half-and-half mixture of sand and peatmoss, in which the cutting is directly inserted. If a number of pots, thus prepared, are packed in peatmoss in a flat about four inches deep, they may readily be kept at the right degree of moisture, even under house conditions. As the roots grow they will utilize the richer soil at the bottoms of the pots.

Summer Cuttings. One of the easiest methods by which the amateur may increase his stock of his favorite varieties is commonly overlooked. Cuttings from firm young shoots from plants in the garden, may be rooted readily in a shaded frame or in any protected, shady spot. Trim back the leaves quite severely to lessen wilting, and spray the cuttings daily during hot weather. Such plants, especially if not allowed to flower, will by fall make roots of good quality if not of large size; or they may be grown in pots to make pot roots (see page 69).

"Root" Cuttings. Still another type of cuttings are those termed—or mistermed—"root cuttings." These are cuttings made by detaching surplus shoots from the base of the plant, securing with each a small piece of the crown, or the tuber. (This type of cutting is not illustrated on page 59, but is such as would result from taking the sprout shown in the upper right-hand illustration, with a small piece of the tuber attached to its base.) Such cuttings make extra-fine strong plants, which produce good tuber clumps. They may often be secured from plants in the garden, when additional sprouts, which are not needed, start from the base of the plant.

Grafts. For the propagation of very valuable varieties, or of those which are inclined to make few and inferior tubers from cuttings, grafting is sometimes used. This method, which is not difficult, will give strong, vigorous young plants with plenty of nourishment back of them, and is a sure way of carrying valuable plants on over winter.

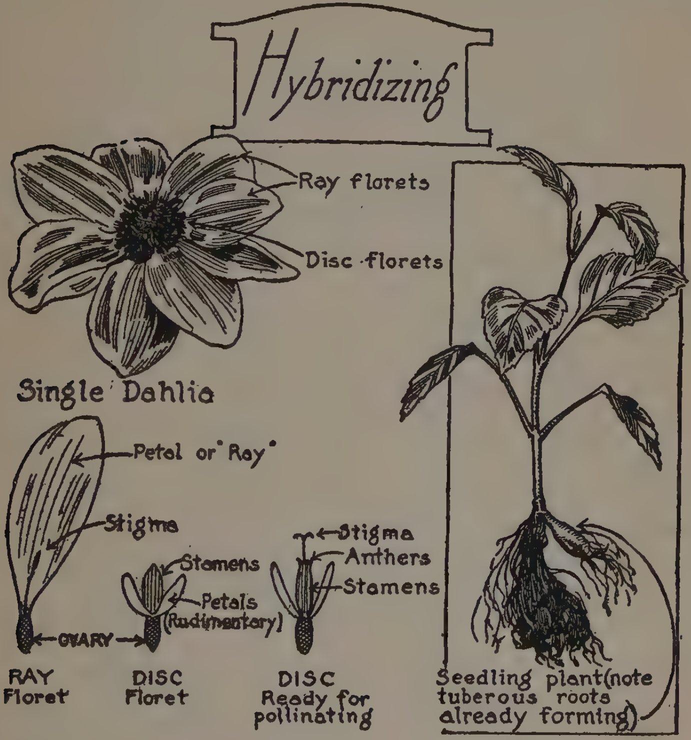
Small bulbs (blind or broken-necked ones will answer) are used for the "stocks." These are cut off at the top, and inserted upright in pots some weeks in advance of making the graft. Rose pots are much better than the standard type for this purpose, being considerably deeper. The pots are plunged and the tubers allowed to root. The grafts, or "scions," are made like the ordinary cutting, except that they are trimmed to a wedge or V-shape below the joint. (See illustration, bottom page 59.) A slit, or a wedge-shaped cut, is made in the tuber, and the graft inserted in this. It should be fastened tightly with raffia, and covered with grafting wax. Plunge pot and all in a frame, in peatmoss deep enough to cover the union, which will usually unite sufficiently to be removed within a month.

"Overpropagation." Before leaving this general subject of green plants from cuttings, I want to emphasize again that a good green plant is just as desirable as a tuber or division for planting. Of late years, a good deal has been written, and still more has been said, about so-called "overpropagation," resulting in the exhaustion or "running out" of some varieties of dahlias. Certain ungrounded theories have also been advanced, to the effect that cuttings should not be taken from seedling plants, or from plants grown from cuttings the season previous, or from pot roots, and so on. If cuttings are wrongly made—by taking too many from one tuber, or growing them weak and spindling, or allowing them to become pot-bound—these individual plants will be affected, but this process can have no possible effect upon the variety. Some commercial growers, selling tubers only, have welcomed and promulgated this prejudice against green plants; and unfortunately too many green plants of poor quality have been distributed. If the plants themselves

are vigorous and healthy, they will produce satisfactory results, regardless of the source from which the cuttings have been obtained.

HYBRIDIZING

Many of our finest dahlias have been produced from accidental or chance crossing. There are some experts who take the position that the factors involved in dahlia hybridizing are so complicated that it is not worth while for the dahlia grower to attempt to control what he is going to produce. But both the pleasure to be had from the production of new varieties, and the average of really well worth while new things obtained,



will be decidedly increased by intelligent, planned hybridizing, aimed at some definite goal.

If one is content to leave his hybridizing to chance, all but the finest varieties should be eliminated from the collection being grown. Hand pollination is much more difficult in the case of the dahlia than with many other flowers, such as the gladiolus or the iris. If a dahlia "flower" is carefully examined it will be found to consist of a great number of individual flowers: those which form the "petals" of either the single or double dahlias are known as the "ray florets"; they possess only stigmas and, therefore, do not produce any pollen, which, of course, is borne upon the tips of the stamens, or anthers. If the center of a single flower is closely examined, it will be found to consist of closely packed small flowers, or "disk florets" which possess only rudimentary petals, but both stamens and pistils: the former terminate in the anthers, which bear the pollen, and the latter in the stigmas, which receive it. (See illustrations on page 65.) When fertilization has taken place, the seeds form in the ovaries.

Different methods are used for fertilizing the ray flowers and the disk flowers.

Ray Flowers. For the ray flowers, proceed as follows: Fasten over the head of the flower selected to produce seed, just as it begins to open, a suitable size glassine or grape-protecting bag; the latter is equipped for fastening, and costs less than a cent. As the "rays," or petals, develop, clip them off just above the ovary, leaving the stigmas exposed; for this purpose grape shears (used for thinning out small grapes in the bunches) are most convenient; or manicure scissors may be used. The following day, the stigmas will be ready for pollinating; this may be done by rubbing them with the center of the flower to be used to supply the pollen—that is the male parent. Or the pollen may be transferred with a camel's-hair brush—usually a less satisfactory method. This pollen flower should have been cut the day before, and kept in the house, to make sure of having a supply of fresh uncontaminated pollen.

Repeat this operation for several days in succession,—

replacing the protecting bag each time—when the disk flowers of the *seed* parent will usually be ready to begin shedding pollen. These should all be snipped off with scissors or pulled out with tweezers, to prevent any of this pollen from getting on the stigmas which have been pollinated or "crossed" for seed. The bag is once more replaced and kept on for a few days until there is no danger of further chance pollinization.

Pollinating the Disk Flowers. With some dahlias, the ray flowers will not set seed, and it becomes necessary to pollinate the disk flowers. The seed, or female, parent should be protected in the way described above; when the flower has developed so that the center may be seen, all of the ray flowers, or "petals," are pulled out. When the anthers of the remaining disk florets (see illustration, page 65) begin to shed their pollen, it is removed by applying a small but forceful stream of water; this may be done with a very small syringe, or a small bulb and glass tube such as dentists use; the only way to make sure that all the pollen grains have been removed is to examine with a hand glass; the drops of water remaining in the flower head should be soaked up with bits of absorbent cotton, or the torn edge of a piece of blotting paper, and the protecting bag replaced.

This operation should be repeated for three days, after which all the remaining disk florets, not yet ready to shed their pollen, are removed; this leaves the stigmas of those which have been washed, or "depollinated," ready to receive the pollen from the male plant, which is applied in the way described above.

Hybridizing is best not undertaken until the flowers are at their finest, in late August or early September; mid-morning, on a bright day, is the best time for doing the work.

The maturing of the seed, if it sets, following the operation of pollinating, will be indicated by the flower stem beginning to dry and shrivel; the seed pods should then be dried up as quickly as possible, on a shelf in the greenhouse or in a sunny window. Frost may sometimes threaten before seed from late pollinization has a chance to ripen. The seed pods should be cut with a fairly long stem and kept indoors, in water in a sunny position. Change the water daily, as for cut flowers, until the stem no longer functions.

After the pods are thoroughly dried, they may be placed in paper bags, or in tin boxes perforated to provide air circulation, and kept in a cool, dry place until planting time. A record of the cross, of course, should be kept with each lot of seeds.

Growing from Seed

Dahlias are easily raised from seed; any beginner may succeed with them.

Select only plump, full-sized seed, as the light, immature ones will not grow.

When to Sow. There is no advantage in starting the seeds too early, as the plants will get overgrown or checked before they can be set out of doors. Mid-March or mid-April is early enough in the latitude of Philadelphia, or farther north. South, they may be planted correspondingly earlier.

Sow in seed pans or in flats, using a light soil composed half of sandy garden loam and half of peatmoss; scatter them just thick enough so they will not touch, as not all will germinate, and cover one-quarter inch deep. Use Semisan as a preventive of possible "damping off." Water moderately with a fine spray, shade from direct bright sunshine, and if possible, provide a temperature of from 60° to 70°.

Some of the seeds will come up quickly, and these should be transferred to flats or to small pots as soon as the second or third sets of leaves begin to develop.

Do not wait until they are as large as the seedling plant illustrated on page 65. It will save space and will give the little plants better growing conditions to transplant them first to flats; they may be changed to pots later if it is too early to set them directly out of doors from the flats. A somewhat heavier and richer soil may be used for transplanting. But some slight shade from very bright midday sunshine should be continued.

Do not discard the seed pans or seed pots until you are positive no more will germinate. Some may take a month or more, and as the singles, and often the less desirable doubles, are likely to germinate first, the late comers should be patiently waited for.

Grow the plants slowly, *with plenty of air* from start to finish. Transfer to the cold frame as soon as possible, and to the open ground as soon as safe. (For information about transplanting and after care, see page 32.)

Give your seedlings the best of care so they may flower normally as soon as possible. Many of them may be eliminated as worthless as soon as the first flowers open, if one is aiming for new varieties; at digging time, select the most promising for growing on the second season. Those which look *most* promising may be propagated by green cuttings the following spring, to "work up a stock" more quickly.

Pot-grown Plants. This method of growing we have already referred to. (See pages 27 and 60.) Abroad it is used considerably for commercial propagation; in this country, so far as I am aware, chiefly for testing out seedlings until they have bloomed the first time. By growing them in pots, a great amount of space may be saved. This method consists merely in planting seedlings—or rooted cuttings, as the case may be—in four- or five-inch pots which are plunged to their rims in a frame, or in the open ground; they may be placed fairly close together. If a deep frame is available, plants from late cuttings, with the tops cut back severely, may be grown on in the frame a month or so later than it would be possible to keep them in the open. The tubers grown are small and crowded close together, but are perfectly serviceable for purposes of further propagation the following spring. The roots, after the tops die, may be stored in the pots, covered with sand or peatmoss, slightly more moist than would be used for tubers.

Summer cuttings of singles, pompons, and dwarf varieties in general, started in small pots, and later shifted to six- or eight-inch pots, and pruned back to induce bushy growth, make unusual and really beautiful plants for the greenhouse, or even indoors, for fall and early winter.

Introducing a New Variety

When a seedling has stood the test of appearing quite as fine to the originator the second season as it did the first, and has also won the favorable comment of competent judges of its merits, it *may* be worth while to attempt to introduce it to commerce.

The first step in this direction is to see if it will win an "A.D.S. Certificate." This means submitting plants for registration and a test-out at the official Trial Grounds of the American Dahlia Society (see page 80). Of course the certificate, if it is won, does not make this new variety any better, but the chances are a thousand to one that if it fails to win a certificate the variety is not really worth introducing. With the hundreds of excellent varieties now generally catalogued, a new seedling must be of superior merit, indeed, to win its way to the front; and there is no object in spending time and money merely to have it listed among the ever-growing throng of "also rans."

If the variety really does prove meritorious, and the beginner is an amateur, his best move is to take his prize baby to some reputable and well-known commercial grower, and to arrange with him to introduce it; or possibly one of the larger seed houses may be interested in presenting it as an exclusive introduction.

CHAPTER VIII

GROWING FOR EXHIBITION

UNQUESTIONABLY the dahlia rejoices in more special shows than any other flower grown. All over the country, in communities ranging from a few thousands up to the largest cities, the local Dahlia Show is one of the important autumn events.

Every real dahlia enthusiast should take part in his or her local show. If one is not being held, and there are a dozen or so other "dahlia fans" in your vicinity, there is nothing you can do that will give you so much fun and profit (dahlia-wise, not monetary), as to help organize and put on a local show. And there are few things which will prove of more civic benefit. I know of many towns where the Dahlia Society, organized for the purpose of holding a show, has developed later into a garden club which has done much for its community. Usually, there are some real dahlia cranks who will object strenuously to allowing any other flower to so much as poke its nose in the door of the dahlia exhibition hall; and I have known men of this type—women are seldom so fanatical over the dahlia as men!—who actually resigned from the Dahlia Society rather than see its activities extended to any other flower. Such extremists, however, mean well, and often they are the most enthusiastic and indefatigable workers in "putting across" the local show.

To the amateur who has any idea of breaking into the commercial game, the shows—local, state, and national—offer one of the most direct and effective means of making oneself and one's dahlias known, and of working up a clientele.

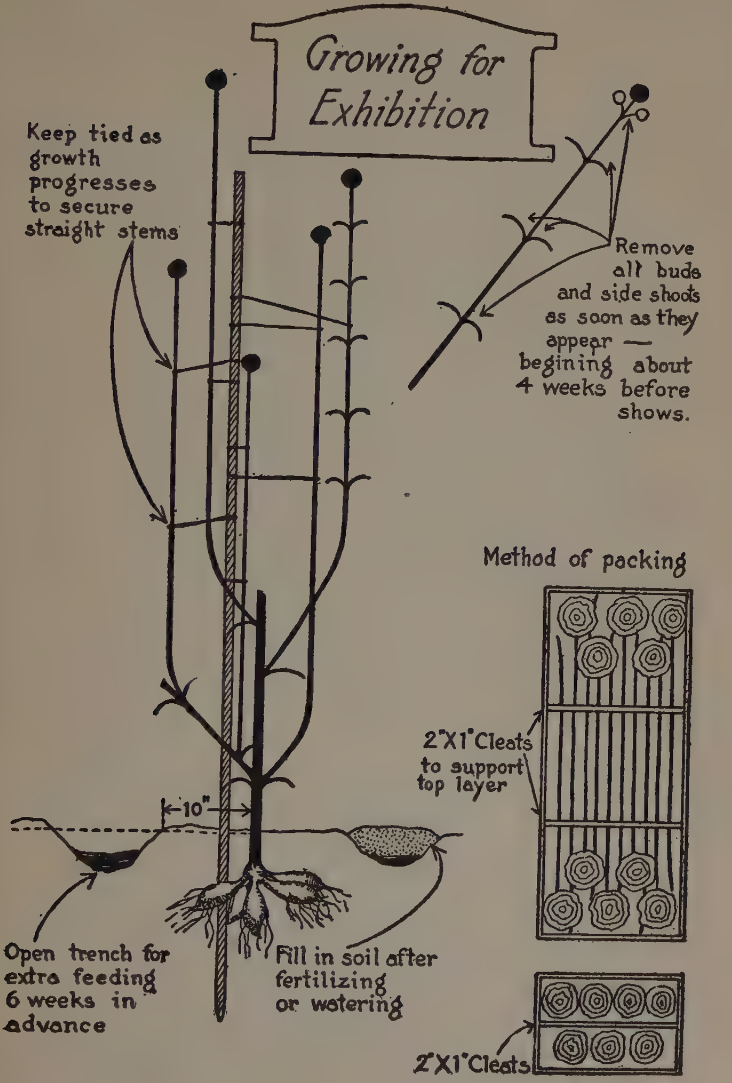
My good friend Dr. F. L. Mulford, president of the American Horticultural Society, known to so many garden groups all over the country through his lectures and other garden activities, has written a very practical and helpful Bulletin on "Horticultural Exhibitions and Garden Competitions" which is published by the Bureau of Plant Industry of the Department of Agriculture. This may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C. It is officially listed as "Circular No. 62, Bureau of Plant Industry."

Growing for Exhibition

In general, the cultural directions already given should be followed out; but if one is aiming particularly at the shows, there are certain points to be stressed, even at the expense of the plants, or the blooms, in other directions. This applies especially to forced feeding late in the summer, and to cutting blooms with the longest possible stems—which practices are likely to affect adversely the qualities of the tubers, both for wintering and for growing the following season.

Selection of Varieties. If you are deliberately going after prizes, use the prize winners. The perusal of half a dozen dahlia catalogues will give you a good idea of what these are, as the headliners at the big shows are naturally played up in the catalogue descriptions. These include such masterpieces as Elite Glory, Jersey's Beauty, Watchung Sunrise, Waldheim Sunshine, and Trentonian. It should be kept in mind, however, that the keenest competition is in the decorative and hybrid-decorative classes, and that if one sets out to grow a good collection of some of the less popular—but *not* less beautiful sorts—such as the singles, cactuses, pompons, or peony-flowered, there is more likelihood of capturing a blue ribbon as well as of contributing to the show a display of really educational value.

Timing for the Show. This may be regulated both by the timing of planting, and by the method of disbranching and disbudding. (See pages 37 and 73.) The latest planting, even up to the middle of July, will produce fine exhibition blooms, if one is content to get but a few from each plant, and to have roots of little value for the following year. Plants


Growing for Exhibition
Keep tied as growth progresses to secure straight stems
Remove all buds and side shoots as soon as they appear — begining about 4 weeks before shows.
Method of packing
2"X1"Cleats to support top layer
10"
Open trench for extra feeding 6 weeks in advance
Fill in soil after fertilizing or watering
2"X1"Cleats

grown for exhibition should be induced to branch low down, thus developing extra-long straight stems for exhibition purposes. These, of course, should be kept tied up as they grow. As a rule it will take a lateral or side branch about four weeks to develop and to form a flower. *All* buds and side shoots should be removed, if one wishes to attain the longest stems and the best foliage,—and it should be kept in mind that in judging, twenty-five points out of a hundred are allowed for stem and foliage, for flowers in vases. It takes the flower-buds from two to three weeks to make blooms from the time they first appear, according to the variety and the growing conditions.

Feeding. Much can be done to increase the size of both foliage and of flowers by extra feeding, in the form of a top dressing for the plants. This should be begun about six weeks before the first show; and it may be repeated two or three times at intervals of a week to ten days. Liquid manure, sheep manure, or tankage, in addition to bone flour and some form of potash, may be employed for this top dressing—more nitrogen than would ordinarily be used; but the nitrogen should not be overdone or the forcing process will defeat its own purpose, as the flowers will be so soft that they will not "stand up" when cut for exhibition. If the plants are making a vigorous normal growth, there is no object in this special feeding excepting to get a few individual blooms of huge size for entering classes where size is the chief objective.

Cutting and Shipping

Both of these subjects have already been discussed (see page 38). The general procedure for cutting and shipping for exhibition is the same except, of course, that particular care should be taken in every detail, especially in packing, so that the individual blooms are given sufficient room and held so securely that there is no possibility of their crushing one another. It is well worth while to wrap each individual flower, for the most important entries, in its own sheet or half-sheet of tissue paper. If they can be transferred to their destination by automobile or truck, this is much better than to trust them to the mercies of the express company.

EXHIBITING

When one still sees, even at the larger shows, rows of dahlias in milk or cream bottles, without so much as a single green leaf to relieve the unnatural appearance, what shall be said?

Perhaps only this. The quality of the exhibits at dahlia shows is surely, if slowly, improving. And every grower, professional or amateur, who attempts to exhibit at all, owes it to the flower which he professes to admire to give his or her exhibit as much artistic merit as possible under the circumstances.

The hard-boiled dahlia fan, out for prizes, may sneer at this suggestion. He may point to the judge's score card and remark that there is no allowance, except in specified classes, for "artistic merit of display." The scale of points adopted by the American Dahlia Society for judging flowers on long stems—and incidentally for growing plants—is as follows:

	Points
Size	20
Substance	15
Form	20
Color	20
Stem and foliage	25

Nevertheless, the artistic merit of the display *does* have some effect upon the judges, whether they are conscious of it or not; for they are human (though sometimes they may not seem so!), and cannot help being influenced, as they should be, by the artistic merit of the display. When that master showman, John Scheepers, first introduced Mr. Waite's Jersey's Beauty, now famous the world over, he was criticized in many quarters for the elaborateness of the display—huge gilt frame, velvet background, flood lights, and so on. Nevertheless, he was setting a new standard, which has since been widely copied. This is the other extreme in exhibiting, and, of course, cannot be generally followed. Nevertheless, *any* exhibitor can take the trouble to have a background for his or her exhibit which will help set off the flowers, and make use of ferns, autumn foliage, cedar boughs, or other "greenery" which will help embellish the display. Dahlia shows are, or should be, primarily for the public; and every exhibitor should feel in honor bound to make his display as attractive as possible *to* the public.

The most certain way to make progress in this direction is to study carefully the exhibits at every show visited; then apply what you learn—and it will be a great deal, if you have kept your eyes open—to the arrangement of your own exhibits, and to the betterment of your own local show.

CHAPTER IX

DAHLIAS FOR PROFIT

THERE is probably no flower which equals the dahlia in the opportunity which it presents for profitable sales from a small local business. Such a business may be considered either as a side line, or as the opening to commercial dahlia-growing which will eventually take one's entire time and energy.

Amateur vs. Professional. One of the points for perennial, and sometimes for heated, discussion in dahlia circles is, "When is an amateur *not* an amateur?" This problem arises both in connection with exhibits at shows, where some classes are open to amateurs only, and also in the purchasing of roots and plants, when many an amateur attempts to pose as a professional in order to get the trade discount rates. Instances are by no means unknown of persons insisting strenuously, when they were exhibiting, that they belonged to the former class, and just as vigorously—when they wanted to buy—that they belonged to the latter!

The American Dahlia Society has adopted the following definition to cover the status of an amateur:

> By the word "Amateur" is understood a person who maintains a garden with a view to his or her own use and enjoyment, and not for the purpose of making a profit or gaining a livelihood.
>
> The fact that such persons dispose of surplus stock—or their entire stock of a seedling—for money, does not change their status, *unless* the maintenance of the garden is intended to return them an annual profit.
>
> No person can compete in the Amateur class who permanently employs a trained gardener, florist, or nurseryman, or who is employed as such.

Another definition classes any one as a commercial or professional grower who publishes a price list of varieties for the purpose of soliciting business.

There are many real amateurs who, for the purpose of making their hobby pay at least a part of its expenses, dispose of their surplus roots in exchange for other stock, or even for cash; but where *making a profit* out of the business is not their primary object, they should hardly be classed as commercial growers.

Some of the bigger—in one sense of the word—commercial growers are quite bitter against the "backyard" and "roadside" growers who sell roots and flowers locally. This has always seemed to me to be a mistaken attitude. If it were not for these same small local growers, the dahlia industry would never have attained to anything like its present proportions. Every such local grower is a nucleus for the spread of dahlia enthusiasm, and dahlia information. Directly and indirectly, he creates for the big growers many times as much business as he takes away from them.

Selling Cut Flowers. The first source of income for the beginner in the commercial dahlia game is likely to be the sale of cut flowers. Too often it is assumed that any dahlia blooms that may be grown will sell. The only real chance of making money from cut dahlias is to grow quality flowers of the best varieties. This is true even for local or roadside sales, and it is doubly so for the grower who anticipates shipping to the wholesale market. The latter is not a business which can be done profitably on a small scale; it requires specialization, and even then is a treacherous trade. The local grower producing extra-quality blooms may better dispose of them, or at least of his surplus, through a florist in some neighboring city with whom he can deal directly.

The selling of flowers, if rightly handled, may often be made to lead to the sale of bulbs or roots, the orders for which can be solicited when the cut flowers are sold. If this branch of the business is contemplated, a show ground, even if it be on a very modest scale at first, is one of the dahlia grower's most important assets. This should not be merely a "dahlia patch." Make it a dahlia garden in the more correct sense of the word—a spot which visitors will find it pleasant to come to, and to bring their friends back to. If the display grounds can be so located that they will "stop" passing motorists, that will be, of course, an additional advantage. A good display of growing flowers will do more to attract attention than all the signs in the world.*

Flower Shows, as an aid to the commercial beginner, have already been mentioned (see page 71). An attractively arranged commercial exhibit at one of the larger shows has started more than one beginner on his way to success. It is a mistake to feel that one must have a big lot of seedlings of his own to display, to make such an exhibit a success. Especially finely grown varieties, no matter how well known they may be, will always attract attention. And if some out-of-the-ordinary item, such as plants flowering in pots, or a fairly complete collection of some of the less well known types of dahlias, is featured as a display it is much more likely to prove an attention-getter, both to the general public and to those who know dahlias—and who make the best customers—than a collection of so-so seedlings, none of which possesses real outstanding merit.

Printed Literature. A price list or catalogue will be a necessity before one gets far in the dahlia business. Too often these are mediocre, to say the least, in both appearance and contents. No matter how inexpensive your "literature" must be, get it up tastefully, and try to give it character and individuality. Good literature cannot be relied upon to sell poor plants; but many good plants do not sell as well as they might, because they are poorly represented in printer's ink.

---

* Some further suggestions on roadside selling are given in the Home Garden Handbook "Gladiolus," to which the reader is referred.

CHAPTER X

THE AMERICAN DAHLIA SOCIETY; LISTS OF SOME GOOD DAHLIAS

The American Dahlia Society, which was organized in 1915, has had much to do with the popularization and the development of the dahlia in this country. It has, from the beginning, sponsored special shows for this flower, and these have been one of the most effective means of keeping alive a keen and up-to-the-minute interest in dahlia varieties. The larger sectional shows, and especially the annual National Show, not only draw crowds of dahlia fans from all over the country, but the more important exhibits, the prize winners in the important classes, and the prize winning new introductions, are described in detail in magazines and trade paper reports. The test gardens, conducted by the Society, have been mentioned by Mr. Hart in his Introduction to this book. The annual dues to the Society—which has its headquarters at New Haven, Connecticut, with William J. Rathgeber, of 198 Norton St., as Secretary, are three dollars a year.

Some Good Dahlia Varieties

It is difficult—not to say dangerous—to recommend particular varieties of any popular flower; it is doubly so with the dahlia, new varieties of which are introduced in such numbers, and the various types of which differ so greatly from one another. The following lists are based not upon personal choice, but are the selections resulting from a combination of ratings from several sources, such as trial ground reports and individual dahlia experts. Many excellent varieties are not listed. Nevertheless, this list will serve as the most available guide not founded merely upon personal preferences. A complete list of ratings may be obtained from J. B. S. Norton of Hyattsville, Maryland, to whom American dahlia growers owe much for his years of work in standardizing dahlia nomenclature, and collecting information as to the comparative value of varieties.

ONE HUNDRED DAHLIA VARIETIES

Averaging Highest Ratings

Ambassador
Al Koran
Amber Queen
A. D. Livoni
Amber Glow

Belle of Springfield
Ben Wilson
Ballet Girl
Bianca
Bertha von Suttner

Champagne
Canteen
Carmencita
California Superba
California Enchantress
Cigarette
Countess of Lonsdale

Daddy Butler

El Dorado
Esther R. Holmes
Edith Slocombe
E. T. Bedford
Ebenezer
Eliza Clark Bull
Earle Williams
Empress Eugenie

Futurity
Francis Lobdell

Giant Ruby
General Miles
Gladys Bates
Glory of New Haven
Gladys Sherwood
Gorgeous
Glorieux
George Walters

Halvella
Hortulanus Fiet

Islam Patrol

Insulinde

Judge Marean
Jersey's Jewel
Jersey's Beauty
Jean Chazot
J. W. Davis
Jean Kerr

Kiwanis
Kittie Dunlap

Lady Helen
Lorna Slocombe
Lady Beatty
Liberty Bond

Mrs. I. de Ver Warner
Mrs. Eleanor Martin
Mrs. John T. Scheepers
Mrs. Richard Lohrmann
Mrs. George W. Elkins
Mrs. James A. Babbitt
Mrs. Jessie Seal
Mrs. Carl Salbach
Mrs. Alex. Waldie
Merritt
Margaret Masson
Maude Adams
Myra Valentine
Mina Burgle

Nerissa
Nobilis

Oberon

Papillon
President Wilson
Patrick O'Mara
Purity

Robert Treat
Rotarian
Rose Pink Century
Rosa Nell
Rookwood

Rene Cayeux

Sagamore
Shudow's Lavender
San Mateo
Senorita
Susan G. Tevis
Snowdrift
Siskiyou

Trentonian
The U. S. A.
The Emperor

The Wizard of Oz
The Oriole
The Grizzly

Violetta
Venus

World's Best White
Winfield Slocomb
Warren S. Seipp
White Sister
Washington City
W. W. Rawson

Some Good Varieties of Each

TEN DECORATIVE

Jersey's Beauty, Mrs. I. de Ver Warner, Sagamore, Mrs. Eleanor Martin, Al Koran, Champagne, El Dorado, Shudow's Lavender, Ben Wilson, World's Best White.

TEN HYBRID CACTUS

MacGreagor, Mariposa, Daddy Butler, Mrs. Richard Lohrmann, Jean Chazot, Esther R. Holmes, Violetta, Ebenezer, Siskiyou, Gladys Sherwood.

TEN CACTUS

Ambassador, Papillon, Gladys Bates, Warren S. Seipp, Ballet Girl, Rene Cayeux, Oberon, Amber Glow, Countess of Lonsdale, Wolfgang von Goethe.

TEN POMPON

Belle of Springfield, Nerissa, Amber Queen, Snowclad, Gretchen Heine, Glow, Little Beeswing, Aimee, Ganymede, San Toy.

TEN SHOW AND HYBRID SHOW

General Miles, Maude Adams, A. D. Livoni, Mrs. C. D. Anderson, Vivian, W. W. Rawson, Miss Helen Hollis, Stradella, Dreer's Yellow, Cuban Giant.

TEN PEONY

The U. S. A., The Oriole, Bertha von Suttner, Gorgeous, Mme. Bystein, King Albert, Mrs. Jessie Seal, Dreamlight, Diana, Uncle Sam.

FIVE COLLARETTE

Achievement, San Mateo Star, Geant de Lyon, Ami Nonin, Maurice Rivoire.

FIVE DUPLEX

Etendard, Camille Frachon, Golden Sunshine, Mme. Coissard, Philadelphia.

FIVE SINGLE

Rose Pink Century, Newport Wonder, Helvetia, Twentieth Century, Dahliadel Century.

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